

**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 NO. 001-34223

CLEAN HARBORS, INC.

(Exact name of registrant as specified in its charter)

Massachusetts

(State or Other Jurisdiction of Incorporation or Organization)

42 Longwater Drive Norwell MA

(Address of Principal Executive Offices)

04-2997780

(IRS Employer Identification No.)

02061-9149

(Zip Code)

Registrant's Telephone Number, Including area code: **(781) 792-5000**

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934:

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, \$0.01 par value	CLH	New York Stock Exchange

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 Exchange 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 twelve months (or for such shorter period that the registrant was required to file such reports) and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T 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 whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Non-accelerated filer

Accelerated filer

Smaller reporting company

Emerging growth company

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

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

On June 28, 2019 (the last business day of the registrant's most recently completed second fiscal quarter), the aggregate market value of the voting and non-voting common stock of the registrant held by non-affiliates of the registrant was approximately \$3.7 billion, based on the closing price of such common stock as of that date on the New York Stock Exchange. Reference is made to Part III of this report for the assumptions on which this calculation is based.

On February 19, 2020, there were outstanding 55,829,761 shares of Common Stock, \$0.01 par value.

DOCUMENTS INCORPORATED BY REFERENCE

Certain portions of the registrant's definitive proxy statement for its 2020 annual meeting of stockholders (which will be filed with the Commission not later than April 22, 2020) are incorporated by reference into Part III of this report.

CLEAN HARBORS, INC.

ANNUAL REPORT ON FORM 10-K

YEAR ENDED DECEMBER 31, 2019

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Disclosure Regarding Forward-Looking Statements

In addition to historical information, this annual report contains forward-looking statements, which are generally identifiable by use of the words "believes," "expects," "intends," "anticipates," "plans to," "seeks," "should," "estimates," "projects," "may," "likely" or similar expressions. Forward-looking statements are neither historical facts nor assurances of future performance. These forward-looking statements are subject to certain risks and uncertainties that could cause actual results to differ materially from those reflected in these forward-looking statements. Factors that might cause such a difference include, but are not limited to, those discussed in this report under Item 1A, "Risk Factors," and Item 7, "Management's Discussion and Analysis on Financial Condition and Results of Operations." Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect management's opinions only as of the date hereof. We undertake no obligation to revise or publicly release the results of any revision to these forward-looking statements. Readers should also carefully review the risk factors described in other documents which we file from time to time with the Securities and Exchange Commission (the "SEC"), including the quarterly reports on Form 10-Q to be filed by us during 2020.

PART I

ITEM 1. BUSINESS

General

Clean Harbors, Inc. and its subsidiaries (collectively, "we," "Clean Harbors" or the "Company") is a leading provider of environmental, energy and industrial services throughout North America. We are also the largest re-refiner and recycler of used oil in the world and the largest provider of parts cleaning and related environmental services to commercial, industrial and automotive customers in North America. One of our primary goals as a company is supporting our customers in finding environmentally responsible solutions to further their sustainability goals in today's world.

We have two operating segments; (i) the Environmental Services segment and (ii) the Safety-Kleen segment.

- **Environmental Services** - Environmental Services segment results are predicated upon the demand by our customers for waste services directly attributable to waste volumes generated by them and project work for which waste handling and/or disposal is required. In managing the business and evaluating performance, management tracks the volumes and mix of waste handled and disposed of through our owned incinerators and landfills, as well as utilization of such incinerators, labor and billable hours and equipment among other key metrics. Levels of activity and ultimate performance associated with this segment can be impacted by several factors including overall U.S. GDP and U.S. industrial production, weather conditions, efficiency of our operations, technology, changing regulations, competition, market pricing of our services and the management of our related operating costs. Environmental Services results are also impacted by the demand for planned and unplanned industrial related cleaning and maintenance services at customer sites and for environmental cleanup services on a scheduled or emergency basis, including response to national events such as major chemical spills, natural disasters or other events where immediate and specialized services are required.
- **Safety-Kleen** - Safety-Kleen segment results are impacted by an array of core service and product offerings that serve to attract small quantity waste producers as customers and integrate them into the Clean Harbors waste network. Core service offerings include parts washer services, containerized waste services, vac services, used motor oil collection and contract blending and packaging services. Key performance indicators tracked by the Company relative to these services include the number of parts washer services performed and pricing and volume of used motor oil and waste collected. Results from these services are primarily driven by the overall number of parts washers placed at customer sites and volumes of waste collected, as well as the demand for and frequency of other offered services. These factors can be impacted by overall economic conditions in the marketplace, especially in the automotive related area. In addition to its core service offerings, Safety-Kleen offers high quality recycled base and blended oil products to end users including fleet customers, distributors and manufacturers of oil products. Other product offerings include automotive related fluids and shop supplies. Relative to its oil related products, management tracks the Company's volumes and relative percentages of base and blended oil sales along with various pricing metrics associated with the commodity driven marketplace. The segment's results are significantly impacted by overall market pricing and product mix associated with base and blended oil products and, more specifically, the market prices of Group II base oils. Costs incurred in connection with the collection of used oil and other raw materials associated with the segment's oil related products can also be volatile. Our OilPlus[®] closed loop initiative, which results in the sale of our renewable oil products directly to our end customers, may also be impacted by changes in customer demand for high-quality, environmentally responsible recycled oil.

Clean Harbors, Inc. was incorporated in Massachusetts in 1980 and our principal executive offices are located in Norwell, Massachusetts. We maintain a website at the following Internet address: <http://www.cleanharbors.com>. Through a link on this

website, we provide free access to our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable after electronic filing with the SEC. Our guidelines on corporate governance, the charters for our board committees and our code of ethics for members of the board of directors, our chief executive officer and our other senior officers are also available on our website, and we will post on our website any waivers of, or amendments to, such code of ethics. Our website and the information contained therein or connected thereto are not incorporated by reference into this Form 10-K.

Health and Safety

Health and Safety is our #1 core value. Employees at all levels of our Company share this philosophy and are committed to ensuring our safety goals are met. Our commitment to health and safety benefits all of our stakeholders to include our employees, our customers, the community and the environment. In 2019, the continued success of our *Safety Starts with Me: Live It 3-6-5* program, which is a key component in our overall safety approach along with our many other programs, enabled us to achieve low Total Recordable Incident Rate, or "TRIR" and Days Away, Restricted Activity and Transfer Rate, or "DART." For the year ended December 31, 2019, our Company wide TRIR and DART were 1.05 and 0.61, respectively. For the year ended December 31, 2018, our Company wide TRIR and DART were 1.08 and 0.63, respectively. As a result of our unrelenting focus on safety, in 2019 the Company achieved its lowest TRIR and DART rates in history.

In order to protect our employees, continue to lower our incident rates and satisfy our customers' demands to retain the best service providers with the lowest TRIR and DART rates, we are fully committed to continuously improving our health and safety performance through ongoing safety initiatives and training as well as technological solutions aimed at keeping all of our 14,400 employees safe. All employees recognize the importance of protecting themselves, their fellow employees, their customers and all those around them from harm. Our commitment is supported by the *Safety Starts with Me: Live It 3-6-5* program, which includes three Safety philosophies, six Golden Rules of Safety and each employee's five personal reasons why they choose to be safe at work, on the road and at home.

Compliance

We regard compliance with applicable environmental regulations as a critical component of our overall operations. We strive to maintain the highest professional standards in our compliance activities. A detailed compliance program has been developed for each of our permitted facilities, service centers and other locations under the direction of our compliance staff and based on the operations specific to each location. The compliance staff is responsible for the facilities' permitting and regulatory compliance, compliance training, transportation compliance and related record keeping. To ensure the effectiveness of our regulatory compliance program, our compliance staff monitors daily operational activities. We also have an Environmental Health and Safety Compliance Internal Audit Program designed to identify any weaknesses or opportunities for improvement in our ongoing compliance programs. We also perform periodic audits and inspections of the disposal facilities owned by other companies which we utilize.

Our facilities are frequently inspected and audited by regulatory agencies, as well as by customers. Although our facilities have been cited on occasion for regulatory violations, we believe that each of our facilities is currently in substantial compliance with applicable permit requirements.

Strategy

Our strategy is to develop and maintain ongoing relationships with a diversified group of customers that have recurring needs for our products and services. We seek to expand market awareness of the breadth of our service offerings to current and future customers through targeted marketing opportunities. We strive to be recognized as the premier supplier of a broad range of value-added services based upon quality, responsiveness, customer service, information technologies and cost effectiveness.

The principal elements of our business strategy in no particular order are:

- **Cross-Sell Across Businesses** - We believe the breadth of our service offerings allows us to provide additional services to existing customers. We believe we can provide industrial and field services to customers that traditionally have only used our technical services and technical services to customers that use our industrial services or oil and gas field services. At the same time, we see a variety of cross-selling opportunities between our Environmental Services and Safety-Kleen segments. Reflecting this strategy, we have been successfully cross-selling the products and services of Safety-Kleen, such as parts washers, various recycling services, cleaning products, and our OilPlus® products through our closed loop initiative, to legacy Clean Harbors customers. We believe leveraging our ability to cross-sell across our segments will drive additional revenue for our Company.

- **Capture Large-Scale Projects** - We provide turnkey offsite transportation and landfill or incineration disposal services for soil and other contaminated materials generated from remediation activities. We also assist remediation contractors and project managers with support services including groundwater disposal, waste disposal, roll-off container management and many other related services. We believe this will drive incremental waste volume to our existing facilities, thereby increasing utilization and enhancing overall profitability.
- **Expand Throughput Capacity of Existing Facilities** - We operate and have made substantial investments in an extensive network of hazardous waste management facilities and oil re-refineries, which provide us with significant operating leverage as volumes increase. In addition, there are opportunities to expand waste handling capacity or waste oil processing at these facilities by modifying the terms of the existing permits and by adding equipment and new technology. Through selected permit modifications, we can expand the range of treatment services offered to our customers without the significant capital investment necessary to acquire or build new waste management facilities.
- **Execute Strategic Acquisitions and Divestitures** - We actively pursue selective acquisitions with certain services or market sectors where we believe the acquisitions can enhance and expand our business. We believe that we can expand existing services through strategic acquisitions in order to generate incremental revenues from existing and new customers and to obtain greater market share. In order to maximize synergies, we rapidly integrate our acquisitions into our existing processes. To complement our acquisition strategy, we regularly review and evaluate our existing operations to determine whether our business model should change through the divestiture of certain businesses. Accordingly, from time to time, we divest certain non-core businesses and reallocate our resources to businesses that we believe better align with our long-term strategic direction. For additional information on our acquisitions and divestitures, see "Acquisitions and Divestitures" below.
- **Focus on Cost, Pricing and Productivity Initiatives** - We continually seek to increase efficiency and to reduce costs through enhanced technology, process improvements and strategic expense management. For instance, in 2019, we successfully undertook site consolidations, greater internalization of maintenance costs, and procurement and supply chain improvements. Additionally, we seek areas in our business where strategic investments in automation, process improvements, tools and employees can serve to increase productivity, efficiency and safety compliance.
- **Expand Geographic Coverage of Service Offerings** - We believe our Environmental Services and Safety-Kleen segments have a competitive advantage due to their vast network of locations across North America, particularly in areas where we maintain service locations at or near a treatment, storage and disposal facility ("TSD"). By opening additional service locations we believe that we can increase our market share within these segments. We believe this will drive additional waste into our existing facilities, thereby increasing utilization and enhancing overall profitability. In addition, our management team continues to assess the competitive landscape in order to identify new business opportunities.

Acquisitions and Divestitures

Acquisitions are an element of our business strategy that involve expansion through the purchase of businesses that complement our existing Company and create opportunities for profitable growth.

In 2019, we acquired two privately-owned businesses for a combined preliminary purchase price of \$25.2 million. One acquisition expands the environmental services and hazardous materials management services of the Environmental Services segment while the second complements the Safety-Kleen segment's core service offerings, such as used motor oil collection, parts washers, oil filter recycling and vacuum services.

In 2018, we acquired the U.S. Industrial Cleaning Business of Veolia Environmental Services North America LLC (the "Veolia Business") as well as a privately-owned company for a combined purchase price of \$151.2 million. The acquisitions provide significant scale and industrial services capabilities, while increasing the size of our existing U.S. Industrial Services business. The acquisitions were financed with cash on hand. The Veolia Business is included in our Environmental Services segment while the privately-owned company has components included in both the Environmental Services and Safety-Kleen segments.

In 2017, we acquired Lonestar West Inc. ("Lonestar"), a public company headquartered in Alberta, Canada, for CAD \$41.8 million (\$33.1 million USD at acquisition date), net of cash acquired. The acquisition price included the assumption of approximately CAD \$21.3 million (\$16.8 million USD at acquisition date) in outstanding debt, which we subsequently repaid. The acquisition supports our growth in the daylighting and hydro excavation services markets. In addition to increasing the size of our hydro vacuum fleet, Lonestar's network of locations provides us with direct access to key geographic markets in both the United States and Canada. The acquired company is included in our Environmental Services segment.

For additional information relating to our acquisition activities during 2019, 2018 and 2017, see Note 4, "Business Combinations," to our consolidated financial statements included in Item 8 of this report.

Other business transactions also include divestitures based on our ongoing review of portfolio assets to determine the extent to which they are contributing to our objectives and growth strategy.

In 2017, we completed the sale of our Transformer Services business, which was a non-core business previously included within the Environmental Services segment, for \$45.5 million (\$43.4 million net of \$2.1 million in transactional related costs). For additional information relating to these divestitures, see Note 5, "Disposition of Businesses," to our consolidated financial statements included in Item 8 of this report.

Protecting the Environment and Corporate Sustainability

Clean Harbors recognizes that sustainability stewardship is a core aspect of our brand and a key component of our long-term success. Our core business is to provide industry, government and the public a wide range of sustainable solutions through environmental, energy and industrial service offerings that protect and restore North America's natural environment. Our sustainability program expands our commitment beyond the services and products to include our operations, employees and community. The program focuses on the following key strategies:

Health and Safety

As we have noted above, Health and Safety is our #1 core value and as such is at the forefront of our sustainability program. Safety is not just the hallmark of our Company but is also at the heart of what we provide to customers. Our programs and procedures focus on delivering services with unparalleled safety to our employees, our customers, local communities and other key stakeholders. Our approach to safety extends to our people, equipment and locations, many of which have qualified for Voluntary Protection Program status under Occupational Safety and Health Administration.

Customer Solutions

Technologies and operational improvements have allowed Clean Harbors to develop initiatives that focus on minimizing the Company's and our customers' impact on the environment. As a leading provider of environmental, energy and industrial services throughout North America, we help our customers prevent the release of chemicals and hazardous waste streams into the environment. We also are the leading service provider in the recovery and decontamination of pollutants that have been released. This includes the safe destruction or disposal of hazardous materials in a manner that ensures these materials are no longer a danger to the environment. When providing these services, we are committed to the recycling, reuse and reclamation of these waste streams whenever possible using a variety of methods more fully explained below in the sections describing our general operations. Many of our branded services exemplify our commitment to sustainability and providing environmental solutions to the marketplace. Where possible, liquids such as solvents, chemicals and used oil are continuously recycled to our high-quality standards and made into useful products. Tolling programs provide a closed process in which the customer's spent solvents are recycled to their precise specifications and returned directly to them.

Our Safety-Kleen OilPlus[®] Program, unique to the oil industry, is designed to help companies manage their oil needs in a more sustainable way. By having us collect used oil and deliver new re-refined oil products, customers are implementing a closed-loop process for sustainability to the oil industry. We deploy our fleet of trucks, tankers, rail-cars and barges to collect used oil. In 2019 we gathered 235 million gallons of used oil in North America and our state-of-the-art processes enable us to fully realize oils' remarkable capacity to be recycled, re-refined and reused. Our plants have re-refined more than 3.7 billion gallons of used oil since their opening, allowing such oils to have a second life as recycled lubricants and avoiding more than 28.7 million metric tons of greenhouse gases.

Energy Usage

One of the Company's sustainability goals is to contribute to a cleaner environment by reducing energy usage, specifically our dependency on fossil fuels. Energy usage at our facilities is the focus of our Facility Energy Conservation program, which provides ongoing oversight and recommendations to our facilities to help support their electricity management efforts. We continue to evaluate solar energy as a viable option for our facilities and have built solar arrays at select sites for their ongoing energy needs.

Clean Harbors makes fleet energy management a key focus, beginning with ongoing reviews by our logistics team to reduce total miles driven. We also evaluate options for reducing fuel costs including routine use of rail transportation, implementation of alternative fuel vehicles and using our Performance Plus and EcoPower re-refined engine oils throughout our fleet. Clean Harbors is constantly upgrading our truck fleet with the most fuel-efficient systems and parts and has also

designed custom, multi-compartment trucks that can be used to collect and deliver oil at the same time, decreasing fuel consumption.

Operations

Clean Harbors instills sustainability within its operations through continuous improvements and well-defined strategic initiatives that show the highest positive impact on the environment, the communities and the economy in which we work and live. Our fleet of transportation vehicles represents one of our largest opportunities to apply environmentally sustainable business practices. Our Asset Refurbishment Program is a comprehensive effort to rebuild assets to "like new" quality with the goal of reusing or recycling 100% of all materials. With four asset refurbishment facilities now operational, we are rebuilding an average of more than two vehicles every week.

To provide an efficient and safe alternative for hazardous waste disposal, Clean Harbors developed and built an incinerator at our El Dorado facility which uses world-class air emissions control technology that meets the most stringent emissions standards under the U.S. Clean Air Act.

Engagement

Clean Harbors believes that by staying engaged with our customers, communities and other stakeholders, we can contribute to the long-term health of the environment, society and the economy. When warranted, we utilize formal reporting platforms to inform customers and other stakeholders of our sustainability efforts, including EcoVadis and Ecodesk.

We develop partnerships with key environmental programs to build awareness, while fostering more sustainable business practices. One of our most highly visible public programs for various government and community entities is known as our Home Hazardous Waste service line. Communities trust us to collect paints, solvents, batteries, fluorescent lamps, pesticides, cleaners and other hazardous materials during one-day, multi-day and mobile programs that otherwise might be improperly disposed of or become dangerous to the communities where they are stored.

Our commitment and our business go hand in hand as we work to provide services and products that complement our customers' sustainability plans and hold ourselves and others accountable to environmental, social and corporate governance standards.

Competitive Strengths

- **Leading Provider of Environmental, Energy and Industrial Services** - We are a leading provider of environmental, energy and industrial services. We own nine commercial hazardous waste incinerators, making us the largest operator of such facilities in North America. We are also one of the few industrial services companies with national footprints in both the U.S. and Canada. We provide multi-faceted, high-quality services to a broad mix of customers. We attract and better serve our customers because of our vast capabilities and breadth of services as well as our overall size, scale and geographic location of our large network along with valuable and unique assets used in providing our services.
- **Integrated Network of Assets** - We believe we operate, in the aggregate, the largest number of commercial hazardous waste incinerators, landfills, treatment facilities and TSDFs in North America. Our broad service network enables us to effectively handle a waste stream from its origin through disposal and to efficiently direct and internalize our waste streams to reduce costs. As our processing of waste increases, our size allows us to leverage our network and increase our profit margins as we can internalize a greater volume of waste in our incinerators, landfills and other disposal facilities. Furthermore, these assets are very difficult to duplicate because significant permitting and regulatory approvals would need to take place in order for new commercial waste disposal sites to come on line. High barriers of entry for such assets provide increased value to our network.
- **Comprehensive Service Capabilities** - Our comprehensive service offerings allow us to act as a full-service provider to our customers. Our breadth of service offerings creates incremental revenue growth as customers seek to minimize the number of outside vendors and demand "one-stop-shop" service providers.
- **Largest Collector and Recycler of Used Motor Oil** - As the largest re-refiner and recycler of used oil in North America, during 2019 we returned approximately 191 million gallons of new re-refined oil, lubricants and byproducts back into the marketplace. In 2019, our re-refining process eliminated more than two million metric tons of greenhouse gas ("GHG"), which is the equivalent of growing more than 53 million trees for 10 years in an urban environment or taking over 393,000 passenger cars off the road for one year.
- **Large and Diversified Customer Base** - Our customers range from small companies to Fortune 500 companies and include public and private entities that span multiple industries and business types, including government entities. This diversification limits our credit exposure to any one customer and potential cyclicity to any one industry. As a

percentage of our 2019 revenues, the top ten industries we serviced totaled approximately 78% and included general manufacturing (16%), chemical (14%), automotive (9%), refineries (8%), base and blended oils (7%), government (6%), utilities (5%), transportation (5%), oil and gas (4%) and engineering and consulting (4%).

- **Stable and Recurring Revenue Base** - We have long-standing relationships with our large customers, many of whom have worked with our Company for decades. Our diversified customer base provides stable and recurring revenues, as a significant portion of our revenues are derived from previously served customers with recurring needs for our services. In addition, switching costs for many of our hazardous waste customers are high. This is due to many customers' desire to audit disposal facilities prior to their qualification as approved sites and to limit the number of facilities to which their hazardous waste are shipped in order to reduce potential liability under United States and Canadian environmental laws and regulations. We have been selected as an approved vendor by large and small generators of waste because we possess comprehensive collection, recycling, treatment, transportation, disposal and hazardous waste tracking capabilities and have the expertise necessary to comply with applicable environmental laws and regulations. Those customers that have selected us as an approved vendor typically continue to use our services on a recurring basis.
- **Regulatory Compliance** - We continue to make capital investments in our facilities to ensure that they are in compliance with current federal, state, provincial and local regulations. Companies that rely on in-house disposal may find the current regulatory requirements to be too capital intensive or complicated, and may choose to outsource many of their hazardous waste disposal needs.
- **Effective Cost Management** - Our significant scale allows us to maintain low costs through standardized compliance procedures, significant purchasing power, leveraging our investment in technology and our ability to efficiently utilize logistics and transportation to economically direct waste streams to the most efficient facility. We also have the ability to use internal resources to transport and process the substantial majority of all hazardous waste that we manage for our customers. In addition, our Safety-Kleen results are significantly impacted by the overall market pricing and product mix associated with base and blended oil products and, more specifically, the market prices of Group II base oils. We charge fees related to our used oil collection services which allow us to effectively manage the profit spreads inherent in our business.
- **Proven and Experienced Management Team** - Our executive management team provides depth and continuity. Our 11 executive officers collectively have over 190 years of experience and expertise in the environmental, energy and industrial services industries. Our chief executive officer founded our Company in 1980 and, since the Company's formation, has served as both the Chief Executive Officer and Chairman of the Board.

Operations

General

Seasonality and Cyclical Nature of Business. Our operations may be affected by seasonal fluctuations due to weather and budgetary cycles influencing the timing of customers' spending for products and services. Typically during the first and fourth quarters of each year there is less demand for our products, oil collection, recycling services and environmental services due to the lower levels of activities by our customers as a result of the cold weather, particularly in Canada and the northern and midwestern regions of the United States. As a result, reduced volumes of waste are received at our facilities, higher operating costs are realized due to sub-freezing weather and high levels of snowfall, factory closings for year-end holidays reduce waste volumes and lower volumes of used oil are generated for our collection.

Geographical Information. For the year ended December 31, 2019, we generated \$2,863.5 million or 83.9% of our direct revenues in the United States and \$548.6 million or 16.1% of our direct revenues in Canada. For the year ended December 31, 2018, we generated \$2,721.8 million or 82.5% of our direct revenues in the United States and \$578.5 million or 17.5% of our direct revenues in Canada. For additional information about the geographical areas from which our direct revenues are derived and in which our assets are located, see Note 3, "Revenues," and Note 20, "Segment Reporting," respectively, to our consolidated financial statements included in Item 8 of this report.

Environmental Services

We collect, transport, treat and dispose of hazardous and non-hazardous waste, including resource recovery, physical treatment, fuel blending, incineration, landfill disposal, wastewater treatment, lab chemical disposal, explosives management and CleanPack® services. Our CleanPack® services include the collection, identification, categorization, specialized packaging, transportation and disposal of laboratory chemicals and household hazardous waste. We also perform a wide range of industrial maintenance and specialty industrial services and utilize specialty equipment and resources to perform field services at any chosen location on a planned or emergency response basis. All of these services are designed to protect the environment and

address environmental related challenges through the use of innovation and the latest technologies. We provide customers with sustainable solutions that seek to recycle waste materials whenever possible.

Technical Services. We provide technical services through a network of service centers from which a fleet of vehicles are dispatched to pick up customers' waste either on a predetermined schedule or on demand, and to deliver the waste to permitted facilities, which are usually Company-owned. Our service centers can also dispatch chemists to a customer location for collection of chemical and laboratory waste for disposal. InSite Service® offerings is a branded on-site/in-plant service delivery program through which we offer a full range of environmental, industrial and waste management services. This signature program is built on safety, quality, efficiency and integrity, and has been offered by Clean Harbors for more than 25 years. By leveraging Clean Harbors' expertise and capabilities, our on-site staffs are dedicated to developing the safest, most cost-effective and sustainable solutions to service customers' needs.

Collection, Transportation and Logistics Management. As an integral part of our services, we collect industrial waste from customers and transport such waste to and between our facilities for treatment or bulking for shipment to final disposal locations. Customers typically accumulate waste in containers, such as 55-gallon drums, bulk storage tanks or 20-cubic-yard roll-off containers. In providing this service, we utilize a variety of specially designed and constructed tank trucks and semi-trailers as well as third-party transporters, including railroads.

Treatment and Disposal. We recycle, treat and dispose of hazardous and non-hazardous industrial waste. The waste handled includes substances which are classified as "hazardous" because of their corrosive, ignitable, infectious, reactive or toxic properties, and other substances subject to federal, state and provincial environmental regulation. We provide final treatment and disposal services designed to manage waste which cannot be otherwise economically recycled or reused. The waste that we handle comes in solid, sludge, liquid and gas form.

We operate a network of TSDFs that collect, temporarily store and/or consolidate compatible waste streams for more efficient transportation to final recycling, treatment or disposal destinations. These facilities hold special permits, such as Part B permits under the Resource Conservation and Recovery Act ("RCRA") in the United States, which allow them to process, transfer and dispose of waste through various technologies including recycling, incineration, landfill and wastewater treatment depending on each location's permitted and constructed capabilities.

Resource Recovery and Fuel Blending. We operate recycling systems for the reclamation and reuse of certain waste, particularly solvent-based waste generated by industrial cleaning operations, metal finishing and other manufacturing processes. Resource recovery involves the treatment of waste using various methods, which effectively remove contaminants from the original material to restore its fitness for its intended purpose and to reduce the volume of waste requiring disposal.

We also operate a recycling facility that recycles refinery waste and spent catalyst. The recycled oil and catalysts, depending on market conditions, are sold to third parties.

Incineration. Incineration is the preferred method for the treatment of organic hazardous waste because it effectively destroys the contaminants at high temperatures. High temperature incineration effectively eliminates organic waste such as herbicides, halogenated solvents, pesticides and pharmaceutical and refinery waste, regardless of form as gas, liquid, sludge or solid. Federal and state incineration regulations require a destruction and removal efficiency of 99.99% for most organic waste.

As of December 31, 2019, we had nine active incinerators operating in five incinerator facilities that offer a wide range of technological capabilities to customers. In the United States, we operate a fluidized bed thermal oxidation unit for maximum destruction efficiency of hazardous waste with an estimated annual practical capacity of 58,808 tons and three solids and liquids capable incinerator facilities with a combined estimated annual practical capacity of 377,387 tons. We also operate one hazardous waste liquid injection incinerator in Canada with total annual practical capacity of 125,526 tons.

Our incinerator facilities in Kimball, Nebraska; Deer Park, Texas; El Dorado, Arkansas; and Aragonite, Utah, are designed to process liquid organic waste, sludge, solids, soil and debris. Our Deer Park facility has two kilns and a rotary reactor. Our El Dorado facility specializes in the treatment of bulk and containerized hazardous liquids, solids and sludge. In 2017, we opened a new hazardous waste incinerator at our El Dorado, Arkansas facility, which specializes in high-temperature incineration of regulated waste such as industrial and laboratory chemicals, manufacturing byproducts, fertilizers and other solid and liquid materials that would otherwise be hazardous to the environment and public health if not properly managed. Our facilities in Kimball and Deer Park also have on-site landfills for the disposal of ash produced as a result of the incineration process.

Our incinerator facility in Lambton, Ontario, is a liquid injection incinerator designed primarily for the destruction of liquid organic waste. Typical waste streams include wastewater with low levels of organics and other higher concentration organic liquid waste not amenable to conventional physical or chemical waste treatment.

Landfills. Landfills are primarily used for disposal of inorganic waste. In the United States and Canada, we operate nine commercial landfills. Seven of our commercial landfills are designed and permitted for disposal of hazardous waste and two of our landfills are operated for non-hazardous industrial waste disposal and, to a lesser extent, municipal solid waste. In addition to our commercial landfills, we also own and operate, as described above, two non-commercial landfills that only accept waste from our on-site incinerators.

Of our seven commercial landfills used for disposal of hazardous waste, five are located in the United States and two are located in Canada. As of December 31, 2019, the useful economic lives of these landfills included approximately 24.6 million cubic yards of remaining capacity. We estimate the useful economic lives of landfills to include permitted airspace and unpermitted airspace that our management believes to be probable of being permitted based on our analysis of various factors. In addition to the capacity included in the useful economic lives of these landfills, there are approximately 31.9 million cubic yards of additional unpermitted airspace capacity included in the footprints of these landfills that may ultimately be permitted, although there can be no assurance that this additional capacity will be permitted. As of December 31, 2019, the useful economic lives of our two non-hazardous industrial landfills have 3.6 million cubic yards of remaining permitted capacity. These two facilities are located in the United States and have been issued operating permits under Subtitle D of RCRA. Our non-hazardous landfill facilities are permitted to accept commercial industrial waste, including waste from foundries, demolition and construction, machine shops, automobile manufacturing, printing, metal fabrications and recycling.

Wastewater Treatment. We operate nine wastewater treatment facilities that offer or employ a range of wastewater treatment technologies. These wastewater treatment operations involve processing hazardous and non-hazardous waste through use of physical and chemical treatment methods. These facilities treat a broad range of industrial liquid and semi-liquid waste containing heavy metals, organics and suspended solids.

Total Project Management. We also provide total project management services in areas such as chemical packing, on-site waste management, remediation, compliance training and emergency spill response, while leveraging Clean Harbors' network of service centers and environmental capabilities.

Industrial Services. We perform industrial maintenance services and specialty industrial services at refineries, mines, upgraders, chemical plants, pulp and paper mills, manufacturing and power generation facilities. We provide these services throughout North America.

Our crews handle as-needed in-plant services to support ongoing in-plant cleaning and maintenance services, including liquid/dry vacuum, hydro-blasting, dewatering and materials processing, water and chemical hauling and steam cleaning. We provide a variety of specialized industrial services including plant outage and turnaround services, decoking and pigging, chemical cleaning, high and ultra-high pressure water cleaning, pipeline inspection and coating services and large tank and surface impoundment cleaning. We also provide daylighting services which, through the use of specialized hydro vac equipment, deliver safer, cleaner and more precise hydro excavation services to safely uncover highly sensitive underground targets. Our crews also handle oilfield transport and production services supporting drilling, production and completion programs.

Field and Emergency Response Services. Our crews and equipment are dispatched on a planned or emergency basis and perform services such as confined space entry for tank cleaning, site decontamination, large remediation projects, demolition, spill cleanup on land and water, railcar cleaning, product recovery and transfer, scarifying and media blasting and vacuum services. Additional services include filtration and water treatment services.

We are also a leader in providing response services for environmental emergencies of any scale from man-made disasters such as oil spills and natural disasters such as hurricanes.

Oil and Gas Field Services. We provide integrated seismic and right-of-way services for efficient resource discovery and site preparation. These services include: (i) seismic surveying that minimizes costs, environmental impact and time in field; (ii) mulching/line clearing that expedites additional geophysical activities and minimizes environmental impact; and (iii) shot-hole drilling that provides safe and efficient operations in every terrain, including hostile and inaccessible regions. We also provide surface rentals services by supporting oil and gas companies' drilling and well completion programs. Key to our services is our ability to provide solids control to support the drilling process. Our technologies help manage liquids, solids and semi-solid material during the drilling operation, and include centrifuges, tanks and drilling fluid recovery. We also can provide container rentals for safe collection of drill cuttings and other waste, as well as manage disposal of drilling fluids and solids and can supply surface rental equipment to support drill sites by providing wellsite trailers, wastewater treatment systems and holding tanks, light towers, generators and handling tools.

Lodging Services. Our fixed lodges provide turnkey remote accommodations throughout Western Canada and Texas and range in size up to approximately 600 beds. These are open lodges, with amenities that include catering and housekeeping services, fully equipped common areas, fitness rooms and computer rooms, wireless internet and public phones, powered

parking stalls, laundry facilities and daily towel service. We also offer mobile camp operations, which provide services for remote workforce accommodation facilities throughout Western Canada, currently in British Columbia, Saskatchewan and Alberta, with multiple accommodation types. These include client and open camps, operator camps and drill camps. Furthermore, hospitality services are available as a standalone service to clients which have other accommodation arrangements.

Safety-Kleen

Our Safety-Kleen business offers an array of environmental services and complementary products to a diverse range of customers including automobile repair shops, car and truck dealers, metal fabricators, machine manufacturers, fleet maintenance shops and other automotive, industrial and retail customers.

As the largest provider of parts cleaning services in North America, Safety-Kleen offers a complete line of specially designed parts washers to customer locations and then delivers recurring service that includes machine cleaning and maintenance and disposal and replacement of clean solvent or aqueous fluids. We also sell automotive and industrial cleaning products which include antifreeze, windshield washer fluid, degreasers, glass and floor cleaners, hand cleaners, absorbents, mats and spill kits.

Utilizing our collection network, we provide pickup and transportation of hazardous and non-hazardous containerized waste for recycling or disposal, primarily through the Clean Harbors network of recycling, treatment and disposal facilities. We also collect used oil which serves as feedstock for our oil re-refineries discussed below, or process the oil into recycled fuel oil, or "RFO," which is then sold to customers such as asphalt plants, industrial plants, pulp and paper companies. The used oil is also processed into vacuum gas oil which can be further re-refined into lubricant base oils or sold directly into the marine diesel oil fuel market.

Our vacuum services remove solids, residual oily water and sludge and other fluids from customers' oil/water separators, sumps and collection tanks. We also remove and collect waste fluids found at large and small industrial locations, including metal fabricators, auto maintenance providers and general manufacturers.

Utilizing used oil collected by Safety-Kleen branches, we manufacture, formulate, package, distribute and market high-quality lubricants. We offer these products and services direct to business end-users and customers that can in turn market to retailers and end-users. The used oil collected by Safety-Kleen's branch network is processed or re-refined to convert into a variety of products, mostly base lubricating oils, and much smaller quantities of asphalt-like material, glycols and fuels. As the largest re-refiner of used oil in North America, we can process the used oil collected through our six re-refineries located in East Chicago, Indiana; Newark, California; Wichita, Kansas; Tacoma, Washington; Fallon, Nevada; and Breslau, Ontario.

Our primary goal is to produce and sell high-quality blended oils, which are created by combining our re-refined base and other base oils with performance additives in accordance with our proprietary formulations and American Petroleum Institute licenses. Our Performance Plus[®] brand and "green" proprietary brand EcoPower[®] are sold to on- and off-road corporate fleets, government entities, automotive service shops and industrial plants, which are serviced through our internal distribution network, as well as an extensive United States and Canada-wide independent distributor network. We also sell unbranded blended oils to distributors that resell them under their private label brands. Our OilPlus[®] program consists of selling our renewable oil products directly to our end customers. We sell the base oil that we do not blend and sell ourselves to independent blenders/packagegers that use it to blend their own branded or private label oils. With more than 200 million gallons of used oil processed annually, we were able to return approximately 191 million gallons of new re-refined oil, lubricants and byproducts back into the marketplace in 2019. We believe our position as the largest collector and re-refiner of used oil in North America, along with our vast service and distributions network, provide a distinct competitive advantage in our ability to provide our customers with collection and oil distribution services through our OilPlus[®] closed loop program.

Competition

The hazardous waste management industry is highly competitive. The sources of competition vary by locality and by type of service rendered, with competition coming from national and regional waste services companies and hundreds of privately-owned firms. Veolia North America, Waste Management, Inc., US Ecology, Inc. and Stericycle, Inc. are the principal national firms with which we compete. Each of these competitors is able to provide one or more of the environmental services we offer.

Under federal and state environmental laws in the United States, generators of hazardous waste remain liable for improper disposal of such waste. Although generators may hire various companies that have the proper permits and licenses, because of the generators' potential liability, they are very interested in the reputation and financial strength of the companies they use for the management of their hazardous waste. We believe that our technical proficiency, safety record, customer service oriented culture and overall reputation are important considerations to our customers in selecting and continuing to

utilize our services. We also believe that the depth of our recycling, treatment and disposal capabilities, our ability to collect and transport waste products efficiently and our pricing are additional significant factors in the market for treatment and disposal services.

Competition within our Environmental Services segment varies by locality and type of service rendered.

- For our landfill and waste services, competitors include several major national and regional environmental services firms, as well as numerous smaller local firms. We believe the availability of skilled technical professional personnel, quality of performance, diversity of services, safety record, quality of assets and use of current technologies, as well as price, are the key competitive factors in this service industry.
- For our industrial, field and emergency responses services, competitors vary by locality and by type of service rendered, with competition coming from national and regional service providers and hundreds of privately-owned firms that offer energy or industrial services. EnviroSystems and Hydrochem PSC in the United States, and CEDA International Corporation and Newalta in Canada, are the principal national firms with which we compete. Each of these competitors is able to provide one or more of the industrial and field services we offer. We believe the availability of specialized equipment and latest technologies, skilled technical professional personnel, quality of performance, diversity of services, safety record and price are the key competitive factors in this industry.
- For our energy related services, competitors vary by locality and type of services provided, with competition coming from national, regional and local service providers. Competition is based on a number of factors, including safety, quality, performance, reliability, service, price, response time and, in some cases, breadth of service offering.

For our Safety-Kleen segment, competitors vary by locality and by type of service rendered, with competition coming from Heritage-Crystal Clean and Veolia North America, along with several regional and local firms. With our Safety-Kleen Oil Plus® closed loop offering, we are competing in certain markets with other North American lubricant distributors.

The principal methods of competition for all of our services and products are quality, price, reliability of service rendered or products sold and technical proficiency. We believe that we offer a more comprehensive range of environmental, energy and industrial services than our competitors in major portions of the United States and Canada.

Employees

As of December 31, 2019, we employed approximately 14,400 active full-time employees, of which 988 in the United States and 676 in Canada were represented by labor unions. We believe that our relationship with our employees is positive. As part of our commitment to employee safety and quality customer service, we have an extensive compliance program and trained environmental, health and safety staff. We adhere to a risk management program designed to reduce potential liabilities to us and to our customers. We also continually strive to invest in our employees through training programs as well as competitive compensation and benefit programs.

Intellectual Property

We have invested significantly in the development of proprietary technology and also to establish and maintain an extensive knowledge of leading technologies. We incorporate these technologies into the services we offer and provide to our customers. As of December 31, 2019, we held a total of 35 U.S. and 12 foreign issued or granted patents (which will expire between 2020 and 2031), one U.S. and one foreign pending patent application, 93 U.S. and 53 foreign trademark registrations and one U.S. and eight foreign pending trademark applications. We also license software and other intellectual property from various third parties. We enter into confidentiality agreements with certain of our employees, consultants and corporate partners, and control access to software documentation and other proprietary information. We believe that we hold adequate rights to all intellectual property used in our business and that we do not infringe upon any intellectual property rights held by other parties.

Management of Risks

We adhere to a program of risk management policies and practices designed to reduce potential liability, as well as to manage customers' ongoing environmental exposures. This program includes installation of risk management systems at our facilities, such as fire suppression, employee training, environmental consciousness, auditing and policy decisions restricting the types of waste handled. We evaluate all revenue opportunities and decline those that we believe involve unacceptable risks.

We dispose of waste at our incinerator, wastewater treatment and landfill facilities, or at facilities owned and operated by other firms that we have audited and approved. We apply established technologies to treatment, storage and recovery of

hazardous waste. We believe our operations are conducted in a safe and prudent manner and in substantial compliance with applicable laws and regulations.

Insurance and Financial Assurance

Our insurance programs cover the potential risks associated with our multifaceted operations from two primary exposures: direct physical damage and third-party liability. We maintain a casualty insurance program providing coverage for vehicles, employer's liability and commercial general liability in the aggregate amount of \$105.0 million, \$102.0 million and \$102.0 million, respectively, per year, subject to retentions of \$2.0 million per occurrence for auto and commercial general liability and \$1.0 million for employers' liability in the United States and \$2.0 million in Canada. We also have workers' compensation insurance whose limits are established by state statutes.

We have pollution liability insurance policies covering potential risks in three areas: as a contractor performing services at customer sites, as a transporter of waste and as a processor of waste at our facilities. The contractor's pollution liability insurance has limits of \$20.0 million per occurrence and \$25.0 million in the aggregate, covering offsite remedial activities and associated liabilities.

For sudden and accidental in-transit pollution liability, our auto liability policy provides the primary \$5.0 million per occurrence of transportation pollution insurance. Our pollution liability policies provide an additional \$75.0 million per occurrence and \$80.0 million in the aggregate for a total of \$80.0 million per occurrence and \$85.0 million in the aggregate, respectively. A \$2.0 million deductible per occurrence applies to this coverage in the United States and Canada.

Federal and state regulations require liability insurance coverage for all facilities that treat, store or dispose of hazardous waste. RCRA, the Toxic Substances Control Act and comparable state hazardous waste regulations typically require hazardous waste handling facilities to maintain pollution liability insurance in the amount of \$1.0 million per occurrence and \$2.0 million in the aggregate for sudden occurrences and \$3.0 million per occurrence and \$6.0 million in the aggregate for non-sudden occurrences. Our liability insurance coverage meets or exceeds all federal and state regulations.

Our international operations are insured under locally placed insurance policies that are compulsory in a specific country. In addition, we have a global foreign liability policy that will provide excess and difference in condition coverage in international countries.

Under our insurance programs, coverage is obtained for catastrophic exposures, cyber security as well as those risks required to be insured by law or contract. It is our policy to retain a significant portion of certain expected losses related primarily to employee benefit, workers' compensation, commercial general and vehicle liability. Provisions for losses expected under these programs are recorded based upon our estimates of the actuarially determined value of the aggregate liability for claims. We believe that policy cancellation terms are similar to those of companies in other industries.

Operators of hazardous waste handling and certain other permitted facilities are required by federal, state, provincial and local regulations to provide financial assurance for closure and post-closure care of those facilities should the facilities cease operation. Closure would include the cost of removing the waste stored at a facility which ceased operating and sending the material to another facility for disposal and the cost of performing certain procedures for decontamination of the facility. As of December 31, 2019, our total estimated closure and post-closure costs requiring financial assurance by regulators were \$472.7 million for our U.S. facilities and \$56.8 million for our Canadian facilities. We have obtained all of the required financial assurance for our facilities through a combination of surety bonds, funded trusts, letters of credit and insurance from qualified insurance companies.

Environmental Regulation

While our business has benefited substantially from increased government regulation of hazardous waste transportation, storage and disposal, the environmental services industry itself is the subject of extensive and evolving regulation by federal, state, provincial and local authorities. We are required to obtain federal, state, provincial and local permits or approvals for each of our hazardous waste facilities. Such permits are difficult to obtain and, in many instances, extensive studies, tests and public hearings are required before the approvals can be issued. We have acquired all operating permits and approvals now required for the current operation of our business, or have applied for, or are in the process of applying for, all permits and approvals needed in connection with continued operation and planned expansion or modifications of our operations.

We make a continuing effort to anticipate regulatory, political and legal developments that might affect operations, but are not always able to do so. We cannot predict the extent to which any environmental legislation or regulation that may be enacted or enforced in the future may affect our operations.

A new regulation primarily impacting the shipping business but which we are monitoring closely as it could impact our business is known as "IMO 2020". On January 1, 2020, the International Maritime Organization (the "IMO") implemented a

new regulation for a 0.50% global sulphur cap for marine fuels. Under the new global cap, ships that traverse the oceans will be required to use marine fuels with a sulphur content of no more than 0.50% sulphur, versus the previous cap of 3.50%, in an effort to reduce the amount of sulphur oxide and decrease pollution and greenhouse gas emissions from the global shipping fleet, which now uses an estimated 3.5 to 4 million barrels per day of fuel oil. The shipping industry is the last major transportation sector to utilize fuel with high levels of sulfur, which is the reason the IMO pushed the industry to more closely align with other transport sectors for pollution reduction.

There are several variables around this regulatory change whereby the impacts of such changes are not yet clear, including anticipated levels of compliance and enforcement. However, it is expected that the implementation of IMO 2020 will result in a significant increase in demand for a broad range of low sulfur distillates including diesel, marine gas oil, marine diesel oil and vacuum gas oil ("VGO") among others. There is uncertainty about the global refinery industry's ability to meet that spike in demand, which could have substantial consequences for the pricing of those products, particularly VGO. The price of VGO typically has a direct impact on the pricing and/or levels of production of base oil. Changes in the marine fuel market as a result of IMO 2020 are also expected to affect the availability of used motor oil, which today is frequently used in the marine market and some of which may be displaced as a result of this new regulation.

United States Hazardous Waste Regulation

Federal Regulations. The most significant federal environmental laws affecting us are the RCRA, the Comprehensive Environmental Response, Compensation and Liability Act, also known as the "Superfund Act," the Clean Air Act, the Clean Water Act and the Toxic Substances Control Act ("TSCA").

RCRA. RCRA is the principal federal statute governing hazardous waste generation, treatment, transportation, storage and disposal. Pursuant to RCRA, the Environmental Protection Agency ("EPA") has established a comprehensive "cradle-to-grave" system for the management of a wide range of materials identified as hazardous waste. States that have adopted hazardous waste management programs with standards at least as stringent as those promulgated by the EPA have been delegated authority by the EPA to administer their facility permitting programs in lieu of the EPA's program.

Every facility that treats, stores or disposes of hazardous waste must obtain a RCRA permit from the EPA or an authorized state agency unless a specific exemption exists, and must comply with certain operating requirements ("Part B" permitting process). RCRA also requires that Part B permits contain provisions for required on-site study and cleanup activities, known as "corrective action," including detailed compliance schedules and provisions for assurance of financial responsibility. See Note 10, "Closure and Post-Closure Liabilities," and Note 11, "Remedial Liabilities," to our consolidated financial statements included in Item 8 of this report for a discussion of our environmental liabilities. See "Insurance and Financial Assurance" above for a discussion of our financial assurance requirements.

The Superfund Act. The Superfund Act is the primary federal statute regulating the cleanup of inactive hazardous substance sites and imposing liability for cleanup on the responsible parties. It provides for immediate EPA coordinated response and removal actions for hazardous substances released into the environment. It also authorizes the government to respond to the release or threatened release of hazardous substances or to order responsible persons to perform any necessary cleanup. The statute provides for strict and, in certain cases, joint and several liability to the parties involved in the generation, transportation and disposal of hazardous substances for the cost of these responses and related costs, and for the cost of damages to natural resources. Under the statute, we may be deemed liable as a generator or transporter of a hazardous substance which is released into the environment, or as the owner or operator of a facility from which there is a release of a hazardous substance into the environment. See Note 18, "Commitments and Contingencies," to our consolidated financial statements included in Item 8 of this report for a description of the principal such proceedings in which we are now involved.

The Clean Air Act. The Clean Air Act was passed by Congress to control the emissions of pollutants into the air and requires permits to be obtained for certain sources of hazardous air pollutants, such as vinyl chloride or air criteria pollutants, such as carbon monoxide. In 1990, Congress amended the Clean Air Act to require further reductions of air pollutants with specific targets for non-attainment areas in order to meet certain ambient air quality standards. These amendments also require the EPA to promulgate regulations which (i) control emissions of 187 hazardous air pollutants; (ii) create uniform operating permits for major industrial facilities similar to RCRA operating permits; (iii) mandate the phase-out of ozone depleting chemicals; and (iv) provide for enhanced enforcement.

The Clean Water Act. This legislation prohibits discharge of pollutants into the waters of the United States without government authorization and regulates the discharge of pollutants into surface waters and sewers from a variety of sources, including disposal sites and treatment facilities. The EPA has promulgated "pretreatment" regulations under the Clean Water Act, which establish pretreatment standards for introduction of pollutants into publicly owned treatment works. In the course of the treatment process, our wastewater treatment facilities generate wastewater, which we discharge to publicly owned treatment

works pursuant to permits issued by the appropriate government authorities. We are required to obtain discharge permits and conduct sampling and monitoring programs.

TSCA. We operate a network of collection, treatment and field services (remediation) facilities throughout North America whose activities are regulated under provisions of TSCA. TSCA established a national program for the management of substances classified as polychlorinated biphenyls ("PCBs") which include waste PCBs as well as RCRA waste contaminated with PCBs. The rules set minimum design and operating requirements for storage, treatment and disposal of PCB waste. Since their initial publication, the rules have been modified to enhance the management standards for TSCA-regulated operations including the decommissioning of PCB transformers and articles, detoxification of transformer oils, incineration of PCB liquids and solids landfill disposal of PCB solids, and remediation of PCB contamination at customer sites.

Other Federal Regulations. In addition to regulations specifically directed at our transportation, storage and disposal facilities, there are a number of regulations that may "pass-through" to the facilities based on the acceptance of regulated waste from affected customer facilities. Each facility that accepts affected waste must comply with the regulations for that waste, facility or industry. Examples of this type of regulation are National Emission Standards for Benzene Waste Operations and National Emissions Standards for Pharmaceuticals Production. Each of our facilities addresses these regulations on a case-by-case basis determined by its requirement to comply with the pass-through regulations.

In our transportation operations, we are regulated by the U.S. Department of Transportation, the Federal Railroad Administration, the Federal Aviation Administration and the U.S. Coast Guard, as well as by the regulatory agencies of each state in which we operate or through which our vehicles pass.

Health and safety standards under the Occupational Safety and Health Act ("OSHA") are also applicable to all of our operations.

State and Local Regulations. Pursuant to the EPA's authorization of RCRA equivalent state run programs, a number of U.S. states have regulatory programs governing the operations and permitting of hazardous waste facilities. Accordingly, the hazardous waste treatment, storage and disposal activities of a number of our facilities are regulated by the relevant state agencies in addition to federal EPA regulation.

Some states classify as hazardous some waste that are not regulated under RCRA. For example, Massachusetts considers waste oil as "hazardous waste" while RCRA does not. Accordingly, we must comply with state requirements for handling state regulated waste, and, when necessary, obtain state licenses for treating, storing and disposing of such waste at our facilities.

Our facilities are also regulated pursuant to state statutes, including those addressing clean water and clean air. Local sewer discharge and flammable storage requirements are applicable to certain of our facilities. Our facilities are also subject to local siting, zoning and land use restrictions. We believe that each of our facilities is in substantial compliance with the applicable requirements of federal and state licenses which we have obtained. Once issued, such licenses have maximum fixed terms of a given number of years, which differ from state to state, ranging from three to ten years. The issuing state agency may review or modify a license at any time during its term. We anticipate that once a license is issued with respect to a facility, the license will be renewed at the end of its term if the facility's operations are in compliance with applicable requirements. However, there can be no assurance that regulations governing future licensing will remain static, or that we will be able to comply with such requirements.

Canadian Hazardous Waste Regulation

In Canada, the provinces retain control over environmental issues within their boundaries and thus have the primary responsibility for regulating management of hazardous waste. The federal government regulates issues of national scope or where activities cross provincial boundaries.

Provincial Regulations. Most of Canada's industrial development and the major part of its population are located in four provinces: Ontario, Quebec, Alberta and British Columbia, each of which have detailed environmental regulations. We operate major waste management facilities in each of these provinces, as well as waste transfer facilities in Nova Scotia and Manitoba.

The main provincial acts dealing with hazardous waste management are:

- Ontario—Environmental Protection Act;
- Quebec—Environmental Quality Act;
- Alberta—Environmental Protection and Enhancement Act; and
- British Columbia—Waste Management Act.

These pieces of legislation were developed by the provinces independently and, among other things, generally control the generation, characterization, transport, treatment and disposal of hazardous waste. Regulations developed by the provinces under the relevant legislation are also developed independently, but are often quite similar in effect and sometimes in application. For example, there is some uniformity in manifest document design and utilization.

Provincial legislation also provides for the establishment of waste management facilities. In this case, the facilities are also controlled by provincial statutes and regulations governing emissions to air, groundwater and surface water and prescribing design criteria and operational guidelines.

Waste transporters require a permit to operate under provincial waste management regulations and are subject to the requirements of the Federal Transportation of Dangerous Goods Act, as discussed below. They are required to report the quantities and disposition of materials shipped.

Canadian Federal Regulations. The Canadian federal government has authority for those matters which are national in scope and in impact and for Canada's relations with other nations. The main federal laws governing hazardous waste management are:

- Canadian Environmental Protection Act (1999) ("CEPA 99"), and
- Transportation of Dangerous Goods Act.

Environment Canada is the federal agency with responsibility for environmental matters and the main legislative instrument is the CEPA 99. This act charges Environment Canada and Health Canada, the Federal agency responsible for the health of individuals, with protection of human health and the environment and seeks to control the production, importation and use of substances in Canada and to control their impact on the environment.

The Export and Import of Hazardous waste Regulations under CEPA 99 control the export and import of hazardous waste and hazardous recyclable materials. By reference, these regulations incorporate the Transportation of Dangerous Goods Act and Regulations, which address identification, packaging, marking and documentation of hazardous materials during transport. CEPA 99 requires that anyone proposing to export or import hazardous waste or hazardous recyclable materials or to transport them through Canada, must notify the Minister of the Environment and obtain a permit to do so. Section 9 of CEPA 99 allows the federal government to enter into administrative agreements with the provinces and territories for the development and improvement of environmental standards. These agreements represent cooperation towards a common goal rather than a delegation of authority under CEPA 99. To facilitate the development of provincial and territorial agreements, the federal, provincial and territorial governments participate in the Canadian Council of Ministers of the Environment ("CCME"). The CCME comprises the 14 environment ministers from the federal, provincial and territorial governments, who normally meet at least once a year to discuss national environmental priorities and to determine work to be carried out under the auspices of the CCME.

Canadian Local and Municipal Regulations. Local and municipal regulations seldom reference direct control of hazardous waste management activities. Municipal regulations and by-laws, however, control such issues as land use designation, access to municipal services and use of emergency services, all of which can have a significant impact on facility operation.

Compliance with Environmental Regulations

The environmental regulations discussed above require that we remediate contaminated sites, operate our facilities in accordance with enacted regulations, obtain required financial assurance for closure and post-closure care of our facilities should such facilities cease operations and make capital investments in order to keep our facilities in compliance with environmental regulations.

As further discussed in Note 10, "Closure and Post-Closure Liabilities," and Note 11, "Remedial Liabilities," to our consolidated financial statements included in Item 8 of this report, we have accrued environmental liabilities as of December 31, 2019, of \$189.8 million. For the years ended December 31, 2019 and 2018, we spent \$18.7 million and \$10.1 million, respectively, to address environmental liabilities.

As discussed more fully above under the heading "Insurance and Financial Assurance," we are required to provide financial assurance with respect to certain statutorily required closure, post-closure and corrective action obligations at our facilities. We have placed the required financial assurance primarily through qualified insurance companies.

As described in Note 18, "Commitments and Contingencies," to our consolidated financial statements included in Item 8 of this report, we are involved in legal proceedings arising under environmental laws and regulations. Alleged failure to comply with laws and regulations may lead to the imposition of fines or the denial, revocation or delay of the renewal of permits and

licenses by government entities. In addition, such government entities, as well as surrounding landowners, may claim that we are liable for environmental damages. Citizens groups have become increasingly active in challenging the grant or renewal of permits and licenses for hazardous waste facilities, and responding to such challenges has further increased the costs associated with establishing new facilities or expanding current facilities. A significant judgment against us, the loss of a significant permit or license or the imposition of a significant fine could have a material effect on our business and future prospects.

ITEM 1A. RISK FACTORS

An investment in our securities involves certain risks, including those described below. You should consider carefully these risk factors together with all of the information included in or incorporated by reference in this report before investing in our securities.

Risks Affecting All of Our Businesses

Our businesses are subject to operational and safety risks.

Provision of environmental, energy and industrial services to our customers by both of our business segments involves risks such as equipment defects, malfunctions and failures and natural disasters, which could potentially result in releases of hazardous materials, damage to or total loss of our property or assets, injury or death of our employees or a need to shut down or reduce operation of our facilities while remedial actions are undertaken. Our employees often work under potentially hazardous conditions. These risks expose us to potential liability for pollution and other environmental damages, personal injury, loss of life, business interruption and property damage or destruction. We must also maintain a solid safety record in order to remain a preferred supplier to our major customers. While we seek to minimize our exposure to such risks primarily through (i) comprehensive training programs, (ii) our Environmental Health and Safety Compliance Internal Audit Program, (iii) vehicle and equipment maintenance programs and (iv) insurance, such programs and insurance may not be adequate to cover all of our potential liabilities.

Our businesses are subject to numerous statutory and regulatory requirements, which may increase in the future.

Our businesses are subject to numerous statutory and regulatory requirements. Our ability to continue to hold licenses and permits required for our businesses is subject to maintaining satisfactory compliance with such requirements. We may incur significant costs to maintain compliance. Also, these requirements may increase in the future as a result of statutory and regulatory changes. Regulators, in addition to investors, customers and the public in general, have been increasingly focused on Environmental, Social and Governance (ESG) and cyber-security practices of companies. We may be subject to additional regulations and disclosure requirements in the future arising from the increased focus on ESG and cyber-security responsibility. In addition, customers may require us to implement or report on certain ESG responsible procedures or standards to continue doing business with us. The occurrence of any of the foregoing could have a material impact on our financial condition or results of operations. Further, although we are very committed to compliance and safety, we may not, either now or in the future, be in full compliance at all times with such statutory and regulatory requirements. Consequently, we may be required to pay fines/penalties for noncompliance and may incur significant costs to maintain or improve our compliance with such requirements.

Our operations are increasingly dependent upon technology. Failure of these technologies, failure to upgrade or innovate these technologies or failure to identify and develop new technologies could have an adverse impact on our results.

Our information technology systems are critical to our operations, customer experience and financial reporting. Malfunctions of these technologies, including disruptions due to natural or man-made disasters (e.g. terrorism, cyber intrusion), could interrupt operations or negatively impact our service to our customers and hurt our business reputation. System failures could also impede our ability to collect and report financial results timely or comply with regulations associated with our operations.

Identification of new and emerging technologies may be a risk and an opportunity to our business. Research and development of new technologies may require significant spending which may negatively impact our operating results. Failure to innovate and focus on new technologies that provide superior alternatives to traditional environmental services, waste disposal or oil collection and re-refining service offerings may negatively impact our financial results.

A cyber security incident could negatively impact our business and our relationships with customers.

We use computers in substantially all aspects of our business operations and also mobile devices and other online activities to connect with our employees and customers. Such uses give rise to cyber security risks, including security breach, espionage, system disruption, theft, disruption of our business operations, remediation costs for repairs of system damage and inadvertent release of information. Our business involves the storage and transmission of numerous classes of sensitive and/or confidential information and intellectual property including, but not limited to, private information about employees and

financial and strategic information about our Company and our business partners. Furthermore, as we pursue our strategy to grow through acquisitions and new initiatives that improve our operations and cost structure, we are also expanding and improving our information technologies, resulting in a larger technological presence and corresponding exposure to cyber security risk. If we fail to assess and identify cyber security risks associated with acquisitions and new initiatives, we may become increasingly vulnerable to such risks. Additionally, while we have implemented measures to prevent security breaches and cyber incidents, our preventative measures and incident response efforts may not be entirely effective. The theft, destruction, loss, misappropriation or release of sensitive and/or confidential information or intellectual property, or interference with our information technology systems or the technology systems of third parties on which we rely, could result in business disruption, negative publicity, brand damage, violation of privacy laws, loss of customers, potential liability and competitive disadvantage, which could have a material adverse effect on our financial position or results of operations.

If we become unable to obtain, at reasonable cost, the insurance, surety bonds, letters of credit and other forms of financial assurance required for our facilities and operations, our business and results of operations would be adversely affected.

We are required to provide substantial amounts of financial assurance to government agencies for closure and post-closure care of our licensed hazardous waste treatment facilities and certain other permitted facilities should those facilities cease operation, and we are also occasionally required to post surety, bid and performance bonds in connection with certain customer projects. As of December 31, 2019, our total estimated closure and post-closure costs requiring financial assurance by regulators were \$472.7 million for our U.S. facilities and \$56.8 million for our Canadian facilities. We have obtained all of the required financial assurance for our facilities through a combination of surety bonds, letters of credit and insurance from qualified insurance companies. The financial assurance related to closure and post-closure obligations of our U.S. facilities will renew in 2020. Our Canadian facilities utilize surety bonds, which renew at various dates throughout 2020, as well as letters of credit.

Our ability to continue operating our facilities and conducting our other operations would be adversely affected if we became unable to obtain sufficient insurance, surety bonds, letters of credit and other forms of financial assurance at reasonable cost to meet our regulatory and other business requirements. The availability of insurance, surety bonds, letters of credit and other forms of financial assurance is affected by our insurers', sureties' and lenders' assessment of our risk and by other factors outside of our control such as general conditions in the insurance and credit markets.

Our insurance coverage and self-insurance reserves may be inadequate to cover all significant risk exposures, and increasing costs to maintain adequate coverage may significantly impact our financial condition and results of operations.

We carry a range of insurance policies intended to protect our assets and operations, including general liability insurance, property damage, business interruption and environmental risk insurance. While we endeavor to purchase insurance coverage appropriate to our risk assessment, we are unable to predict with certainty the frequency, nature or magnitude of claims for direct or consequential damages, and as a result our insurance program may not fully cover us for losses we may incur. In addition, as a result of a number of catastrophic weather and other events, insurance companies have incurred substantial losses and in many cases they have substantially reduced the nature and amount of insurance coverage available to the market, have broadened exclusions and/or have substantially increased the cost of such coverage. If this trend continues, we may not be able to maintain insurance of the types and coverage we desire at reasonable rates. A partially or completely uninsured claim against us (including liabilities associated with cleanup or remediation at our facilities), if successful and of sufficient magnitude, could have a material adverse effect on our business, financial condition and results of operations. Any future difficulty in obtaining insurance could also impair our ability to secure future contracts, which may be conditioned upon the availability of adequate insurance coverage. In addition, claims associated with risks for which we are self-insured (workers' compensation, employee medical, comprehensive general liability and vehicle liability) may exceed our recorded reserves, which could negatively impact future earnings.

Tax interpretations and changes in tax regulations and legislation could adversely affect our results of operations.

We are subject to income taxes in the United States, Canada and various state and local jurisdictions. Tax interpretations, regulations and legislation in the various jurisdictions in which we operate are subject to change and uncertainty and can impact net income, income tax expense and deferred income tax assets or liabilities. Our interpretation of tax rules and regulations, including those relating to foreign jurisdictions, requires judgment that may be challenged by taxation authorities upon audit. Although we believe our assumptions, judgments and estimates are reasonable, changes in tax laws or our interpretation of tax laws and the resolution of any tax audits could significantly impact the amounts provided for income taxes in our consolidated financial statements.

Fluctuations in foreign currency exchange could affect our financial results.

We earn revenues, pay expenses, own assets and incur liabilities in countries using currencies other than the U.S. Dollar. In fiscal 2019, we recorded approximately 16.1% of our direct revenues in Canada. Because our consolidated financial statements are presented in U.S. Dollars, we must translate revenues, income and expenses as well as assets and liabilities into U.S. Dollars at exchange rates in effect during or at the end of each reporting period. Therefore, increases or decreases in the value of the U.S. Dollar against other currencies in countries where we operate affect our results of operations and the value of balance sheet items denominated in foreign currencies.

Failure to correctly identify and manage acquisitions and divestitures could adversely impact our future results.

We continuously evaluate potential acquisition candidates and from time to time acquire companies that we believe will strategically fit into our business and growth objectives. If we are unable to successfully integrate and develop acquired businesses, we could fail to achieve anticipated synergies and cost savings, including any expected increases in revenues and operating results, which could have a material adverse effect on our financial results. We also continually review our portfolio of assets to determine the extent to which assets or group of assets are contributing to our objectives and growth strategy. When we decide to sell a business or specific asset group, we may be unable to do so on satisfactory terms and within our anticipated time frame.

We have acquired, and expect generally to acquire, all the outstanding shares of our more significant acquired companies. Due to this acquisition method our investment in those companies are or will be subject to all of their liabilities other than their respective debts which we paid or will pay at the time of the acquisitions. Unknown liabilities or other obligations may adversely affect our financial condition and results of operations.

Certain adverse conditions have required, and future conditions might require, us to make substantial write-downs in our assets, which have adversely affected or would adversely affect our balance sheet and results of operations.

We review our long-lived tangible and intangible assets for impairment whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. We also test our goodwill and indefinite-lived intangible assets for impairment at least annually on December 31, or when events or changes in the business environment indicate that the carrying value of a reporting unit or indefinite lived intangible may exceed its fair value. During each of 2019, 2018 and 2017, we determined that no asset write-downs were required. However, if conditions in any of the businesses in which we operate were to deteriorate, we could determine that certain of our assets are impaired and we would then be required to write-off all or a portion of the value of such assets. Any significant write-offs would adversely affect our balance sheet and results of operations.

Our growth and success are dependent upon key personnel. If we lose key personnel and are unable to hire additional qualified personnel in a timely manner, our business may be harmed.

Our ability to continue to grow, operate our facilities and provide our services is dependent upon the expertise of certain key managerial and technical personnel. The market for skilled and experienced personnel is highly competitive. Our ability to retain key personnel and/or attract new qualified personnel may have an impact on our business and financial results.

Natural disasters or other catastrophic events could negatively affect our business, financial condition and results of operations.

Natural disasters such as hurricanes, tornados or earthquakes could negatively affect our operations and financial performance. Such events could result in physical damage to one or more of our facilities or equipment, the temporary lack of an adequate workforce in a market and the temporary disruption in rail or truck transportation services upon which we rely. These events could prevent or delay shipments and reduce both volumes and revenue. Weather conditions and other event driven special projects also cause interim variations in our results. We may be required to suspend operations in some or all of our locations, which could have a material adverse effect on our business, financial condition and results of operations.

Additional Risks Affecting Our Environmental Services Business

The hazardous waste management business which our Environmental Services segment operates is subject to significant environmental liabilities.

We have accrued environmental liabilities valued as of December 31, 2019 at \$189.8 million, substantially all of which we assumed in connection with certain acquisitions. We calculate our environmental liabilities on a present value basis in accordance with generally accepted accounting principles, which take into consideration both the amount of such liabilities and the timing when we project that we will be required to pay such liabilities. We anticipate our environmental liabilities will be payable over many years and that cash flows generated from our operations will generally be sufficient to fund the payment of

such liabilities when required. However, events not now anticipated (including future changes in environmental laws and regulations or their enforcement) could require that such payments be made earlier or in greater amounts than we now estimate, which could adversely affect our financial condition and results of operations.

We may also assume additional environmental liabilities as part of future acquisitions. Although we will endeavor to accurately estimate and limit environmental liabilities presented by the businesses or facilities to be acquired, some liabilities, including ones that may exist only because of the past operations of an acquired business or facility, may prove to be more difficult or costly to address than we then estimate. It is also possible that government officials responsible for enforcing environmental laws may believe an environmental liability is more significant than we then estimate, or that we will fail to identify or fully appreciate an existing liability before we become legally responsible to address it.

The hazardous waste management industry in which we participate is subject to significant economic and business risks.

The future operating results of our Environmental Services segment may be affected by such factors as our ability to utilize our facilities and workforce profitably in the face of intense price competition, maintain or increase market share in an industry which has in the past experienced significant downsizing and consolidation, realize benefits from cost reduction programs, generate incremental volumes of waste to be handled through our 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 our facilities, minimize downtime and disruptions of operations and develop our field services business. In particular, economic downturns or recessionary conditions in North America, and increased outsourcing by North American manufacturers to plants located in countries with lower wage costs and less stringent environmental regulations, have adversely affected and may in the future adversely affect the demand for our services. Our Environmental Services business is also cyclical to the extent that it is dependent upon a stream of waste from cyclical industries such as chemical and petrochemical. If those cyclical industries slow significantly, the business that we receive from them would likely decrease.

The extensive environmental regulations to which we are subject may increase our costs and potential liabilities and limit our ability to expand our facilities.

Our operations and those of others in the environmental services industry are subject to extensive federal, state, provincial and local environmental requirements in both the United States and Canada, including those relating to emissions to air, discharged wastewater, storage, treatment, transport and disposal of regulated materials and cleanup of soil and groundwater contamination. In particular, if we fail to comply with government regulations governing the transport of hazardous materials, such failure could negatively impact our ability to collect, process and ultimately dispose of hazardous waste generated by our customers. Efforts to conduct our operations in compliance with all applicable laws and regulations, including environmental rules and regulations, require programs to promote compliance, such as training employees and customers, purchasing health and safety equipment and in some cases hiring outside consultants and lawyers. Even with these programs, we and other companies in the environmental services industry are routinely faced with government enforcement proceedings, which can result in fines or other sanctions and require expenditures for remedial work on waste management facilities and contaminated sites. Certain of these laws impose strict and, under certain circumstances, joint and several liability on current and former owners and operators of facilities that release regulated materials or that generate those materials and arrange for their disposal or treatment at contaminated sites. Such liabilities can relate to required cleanup of releases of regulated materials and related natural resource damages. The landscape of environmental regulation to which we are subject can change. Changes to environmental regulation often present new business opportunities for us; however, such changes may also result in increased operating and compliance costs or, in more significant cases, changes to how our facilities are able to operate. We constantly monitor the landscape of environmental regulation; however, our ability to navigate through any changes to such regulations may result in a material effect on our operations, cash flows or financial condition.

From time to time, we have paid fines or penalties in government environmental enforcement proceedings, usually involving our waste treatment, storage and disposal facilities. Although none of these fines or penalties that we have paid in the past has had a material adverse effect upon us, we might in the future be required to make substantial expenditures as a result of government proceedings which would have a negative impact on our financial condition and results of operations. Furthermore, regulators have the power to suspend or revoke permits or licenses needed for operation of our plants, equipment, and vehicles based on, among other factors, our compliance record, and customers may decide not to use a particular disposal facility or do business with us because of concerns about our compliance record. Suspension or revocation of permits or licenses would impact our operations and could have a material impact on our financial results. Although we have never had any of our facilities' operating permits revoked, suspended or non-renewed involuntarily, it is possible that such an event could occur in the future.

Some environmental laws and regulations impose liability and responsibility on present and former owners, operators or users of facilities and sites for contamination at such facilities and sites without regard to causation or knowledge of

contamination. Past practices have resulted in releases of regulated materials at and from certain of our facilities, or the disposal of regulated materials at third-party sites, which may require investigation and remediation, and potentially result in claims of personal injury, property damage and damages to natural resources. In addition, we occasionally evaluate various alternatives with respect to our facilities, including possible dispositions or closures. Investigations undertaken in connection with these activities may lead to discoveries of contamination that must be remediated, and closures of facilities might trigger compliance requirements that are not applicable to operating facilities. We are currently conducting remedial activities at certain of our facilities and paying a portion of the remediation costs at certain sites owned by third parties. While, based on available information, we believe these remedial activities will not result in a material effect upon our operations or financial condition, these activities or the discovery of previously unknown conditions could result in material costs.

In addition to the costs of complying with environmental laws and regulations, we incur costs defending against environmental litigation brought by government agencies and private parties. We are now, and may in the future be, a defendant in lawsuits brought by parties alleging environmental damage, personal injury and/or property damage, which may result in our payment of significant amounts.

Environmental and land use laws also impact our ability to expand our facilities. In addition, we are required to obtain government permits to operate our facilities, including all of our landfills. Even if we comply with all applicable environmental laws, we might not be able to obtain requisite permits from applicable government authorities to extend or modify such permits to fit our business needs.

If our assumptions relating to expansion of our landfills should prove inaccurate, our results of operations and cash flow could be adversely affected.

When we include permitted or probable expansion airspace in our calculation of available airspace, we adjust our landfill liabilities to the present value of projected costs for cell closure and landfill closure and post-closure. It is possible that our estimates or assumptions could ultimately turn out to be significantly different from actual results. In some cases we may be unsuccessful in obtaining an expansion permit or we may determine that an expansion permit is no longer probable. To the extent that such estimates, or the assumptions used to make those estimates, prove to be significantly different than actual results, or our beliefs that we will receive expansion permits change adversely in a significant manner, our landfill assets, including the assets incurred in the pursuit of the expansion, may be subject to impairment. Furthermore, lower prospective profitability may result due to increased interest accretion and depreciation or asset impairment charges related to the removal of previously included expansion airspace. In addition, if our assumptions concerning expansion airspace should prove inaccurate, certain of our cash expenditures for closure of landfills could be accelerated and adversely affect our results of operations and cash flow.

A significant portion of our Environmental Services business depends upon the demand for cleanup of major spills and other remedial projects and regulatory developments over which we have no control.

Our operations can be affected by the commencement and completion of cleanup of major spills and other events, customers' decisions to undertake remedial projects, seasonal fluctuations due to weather and budgetary cycles influencing the timing of customers' spending for remedial activities, the timing of regulatory decisions relating to hazardous waste management projects, changes in regulations governing the management of hazardous waste, secular changes in the waste processing industry towards waste minimization and the propensity for delays in the demand for remedial services and changes in the myriad of government regulations governing our diverse operations. We do not control such factors and, as a result, our revenue and income can vary from quarter to quarter, and past financial results for certain quarters may not be a reliable indicator of future results for comparable quarters in subsequent years.

Additional Risks Affecting Our Safety-Kleen Business

Fluctuations in oil prices may negatively affect our Safety-Kleen business.

A significant portion of our Safety-Kleen business involves collecting used oil from certain of our customers, re-refining a portion of such used oil into base and blended lubricating oils and then selling both such re-refined oil and the recycled oil ("RFO"), to other customers. Changes in the reported spot market prices of oil affect the prices at which we can sell our re-refined oil and RFO. If applicable rates increase or decrease, we typically will charge a higher or lower corresponding price for these oil products. The prices at which we sell these oil products can also be affected by changes in certain indices measuring changes in the price of heavy fuel oil, with increases and decreases in the indices typically translating into a higher or lower price for these oil products. The cost to collect used oil, including the amounts we pay to obtain a portion of our used oil and therefore ability to collect necessary volumes and the fuel costs of our oil collection fleet, typically also increases or decreases when the relevant indices increase or decrease. However, even though the prices we can charge for these oil products and the costs to collect and re-refine used oil and process RFO typically increase and decrease together, there is no assurance that when our costs to collect and re-refine used oil and process RFO increase we will be able to increase the prices we charge for these

oil products to cover such increased costs, or that our costs to collect and re-refine used oil and process RFO will decline when the prices we can charge for such oil products decline. These risks are exacerbated when there are rapid fluctuations in these oil indices.

Environmental laws and regulations have adversely affected and may adversely affect Safety-Kleen's parts cleaning and other solvent related services.

In connection with its parts cleaning and other solvent related services, Safety-Kleen has been subject to fines and certain orders requiring it to take environmental remedial action. Safety-Kleen may also be subject to monetary fines, civil or criminal penalties, remediation, cleanup or stop orders, injunctions, orders to cease or suspend certain practices or denial of permits required for the operation of its facilities. The outcome of any proceeding and associated costs and expenses could have a material adverse impact on Safety-Kleen's financial condition and results of operations.

Recent and potential changes in environmental laws and regulations may also adversely affect future Safety-Kleen parts cleaning and other solvent related services. Interpretation or enforcement of existing laws and regulations, or the adoption of new laws and regulations, may require Safety-Kleen to modify or curtail its parts cleaning operations or replace or upgrade its facilities or equipment at substantial cost, which we may not be able to pass on to our customers, and we may choose to indemnify our customers from any fines or penalties they may incur as a result of these new laws and regulations. On the other hand, in some cases if new laws and regulations are less stringent, Safety-Kleen's customers or competitors may be able to manage waste more effectively themselves, which could decrease the need for Safety-Kleen's parts cleaning and other solvent related services or increase competition, which could adversely affect Safety-Kleen's results of operations.

Safety-Kleen is subject to existing and potential product liability lawsuits.

Safety-Kleen has been named from time to time as a defendant in product liability lawsuits in various courts and jurisdictions throughout the United States. As of December 31, 2019, Safety-Kleen was involved in approximately 55 such proceedings (including cases which have been settled but not formally dismissed) wherein persons claim personal injury resulting from the use of its parts cleaning equipment or cleaning products. These proceedings typically involve allegations that the solvents used in Safety-Kleen's parts cleaning equipment contain contaminants or that Safety-Kleen's recycling process does not effectively remove the contaminants that become entrained in the solvents during their use. In addition, certain claimants assert that Safety-Kleen failed to adequately warn the product user of potential risks, including a historic failure to warn that such solvents contain trace amounts of toxic or hazardous substances such as benzene.

Safety-Kleen maintains insurance that we believe will provide coverage for these claims (over amounts accrued for self-insured retentions and deductibles in certain limited cases). This insurance may not provide coverage for potential awards of punitive damages against Safety-Kleen. Although Safety-Kleen has vigorously defended and will continue to vigorously defend itself and the safety of its products against all of these claims, these lawsuits are subject to many uncertainties and outcomes cannot be predicted with assurance. Safety-Kleen may also be named in additional product liability lawsuits in the future, including claims for which insurance coverage may not be available. If any one or more of these lawsuits were decided unfavorably against Safety-Kleen and the plaintiffs were awarded punitive damages, or if insurance coverage were not available for any such claim, our financial condition and results of operations could be materially and adversely affected. Additionally, if any one or more of these lawsuits were decided unfavorably against Safety-Kleen, such outcome may encourage more lawsuits against us.

Risks Relating to Our Levels of Debt and Letters of Credit

Our substantial levels of outstanding debt and letters of credit could adversely affect our financial condition and ability to fulfill our obligations.

As of December 31, 2019, we had outstanding \$845.0 million of senior unsecured notes, \$734.7 million of senior secured term loans, and \$146.9 million of letters of credit. Our substantial levels of outstanding debt and letters of credit may:

- adversely impact our ability to obtain additional financing in the future for working capital, capital expenditures, acquisitions or other general corporate purposes or to repurchase our senior unsecured notes from holders upon any change of control;
- require us to dedicate a substantial portion of our cash flow to payment of interest on our debt and fees on our letters of credit, which reduces the availability of our cash flow to fund working capital, capital expenditures, acquisitions and other general corporate purposes;
- subject us to the risk of increased sensitivity to interest rate increases based upon variable interest rates, including interest on \$384.7 million of our \$734.7 million senior secured term loans for which we do not currently have interest rate hedges and borrowings (if any) under our revolving credit facility;

- increase the possibility of an event of default under the financial and operating covenants contained in our debt instruments; and
- limit our ability to adjust to rapidly changing market conditions, reduce our ability to withstand competitive pressures and make us more vulnerable to a downturn in general economic conditions of our business than our competitors with less debt.

Our ability to make scheduled payments of principal or interest with respect to our debt, including our outstanding senior unsecured notes, our secured term loans, any revolving loans and our finance leases, and to pay fee obligations with respect to our letters of credit, will depend on our ability to generate cash and our future financial results. If we are unable to generate sufficient cash flow from operations in the future to service our debt and letter of credit fee obligations, we might be required to refinance all or a portion of our existing debt and letter of credit facilities or to obtain new or additional such facilities. However, we might not be able to obtain any such new or additional facilities on favorable terms or at all.

Despite our substantial levels of outstanding debt and letters of credit, we could incur substantially more debt and letter of credit obligations in the future.

Although our revolving credit agreement and the indentures and loan agreements governing our other outstanding debt contain restrictions on the incurrence of additional debt (including, for this purpose, reimbursement obligations under outstanding letters of credit), these restrictions are subject to a number of qualifications and exceptions and the additional debt which we might incur in the future in compliance with these restrictions could be substantial. In particular, as of December 31, 2019, we had up to approximately \$229.2 million available for additional borrowings and letters of credit under our revolving credit facility. Our revolving credit agreement and the indentures and loan agreement governing our other outstanding debt also allow us to borrow significant amounts of money from other sources. These restrictions also do not prevent us from incurring obligations (such as operating leases) that do not constitute “debt” or “indebtedness” as defined in the relevant agreements. To the extent we incur in the future additional debt and letter of credit or other obligations, the related risks would increase.

The covenants in our debt agreements restrict our ability to operate our business and might lead to a default under our debt agreements.

Our revolving credit agreement and the indentures and loan agreement governing our other outstanding debt limit, among other things, the extent to which the Company or our restricted subsidiaries can:

- incur or guarantee additional indebtedness (including, for this purpose, reimbursement obligations under letters of credit) or issue preferred stock;
- pay dividends or make other distributions to our stockholders;
- purchase or redeem capital stock or subordinated indebtedness;
- make investments;
- create liens;
- incur restrictions on the ability of our restricted subsidiaries to pay dividends or make other payments to us;
- sell assets, including capital stock of our subsidiaries;
- consolidate or merge with or into other companies or transfer all or substantially all of our assets; and
- engage in transactions with affiliates.

As a result of these covenants, we may not be able to respond to changes in business and economic conditions and to obtain additional financing, if needed, and we may be prevented from engaging in transactions that might otherwise be beneficial to us. Our revolving credit facility requires, and our future credit facilities may require, us to maintain under certain circumstances certain financial ratios and satisfy certain other financial condition tests. Our ability to meet these financial ratios and tests can be affected by events beyond our control, and we may not be able to meet those tests. The breach of any of these covenants could result in a default under our outstanding or future debt. Upon the occurrence of an event of default, the lenders could elect to declare all amounts outstanding under such debts, including accrued interest or other obligations, to be immediately due and payable. If amounts outstanding under such debt were accelerated, our assets might not be sufficient to repay in full that debt and our other debt.

Our revolving credit agreement and the indenture and loan agreement governing our other outstanding debt also contain cross-default and cross-acceleration provisions. Under these provisions, a default or acceleration under one instrument

governing our debt may constitute a default under our other debt instruments that contain cross-default and cross-acceleration provisions, which could result in the related debt and the debt under such other instruments becoming immediately due and payable. In such event, we would need to raise funds from alternative sources, which funds might not be available to us on favorable terms, on a timely basis or at all. Alternatively, such a default could require us to sell assets and otherwise curtail operations to pay our creditors. The proceeds of such a sale of assets or curtailment of operations might not enable us to pay all of our liabilities.

Other Risks Relating to Our Common Stock

The Massachusetts Business Corporation Act and our By-Laws contain certain anti-takeover provisions.

Sections 8.06 and 7.02 of the Massachusetts Business Corporation Act provide that Massachusetts corporations which are publicly-held must have a staggered board of directors and that written demand by holders of at least 40% of the outstanding shares of each relevant voting group of stockholders is required for stockholders to call a special meeting unless such corporations take certain actions to affirmatively "opt-out" of such requirements. In accordance with these provisions, our By-Laws provide for a staggered board of directors which consists of three classes of directors of which one class is elected each year for a three-year term, and require that written application by holders of at least 25% (which is less than the 40% which would otherwise be applicable without such a specific provision in our By-Laws) of our outstanding shares of common stock is required for stockholders to call a special meeting. In addition, our By-Laws prohibit the removal by the stockholders of a director except for cause. These provisions could inhibit a takeover of our Company by restricting stockholders' action to replace the existing directors or approve other actions which a party seeking to acquire us might propose. A takeover transaction would frequently afford stockholders an opportunity to sell their shares at a premium over then market prices.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 2. PROPERTIES

Our principal executive offices are in Norwell, Massachusetts. In the first quarter of 2020, we purchased our primary executive office building in Norwell which occupies 104,008 square feet. We also currently lease 52,418 square feet of additional office space in Norwell under arrangements which may not expire until 2042. We also have regional administrative offices in Texas and South Carolina, as well as Alberta, Canada and Hyderabad, India. Our properties are sufficient and suitable for our current needs.

We have a network of more than 480 service locations across 49 states, eight Canadian provinces, Puerto Rico and Mexico. Those service locations include service centers, satellite locations, branches, active hazardous waste management properties, lodging facilities and oil processing facilities. The service centers and branches are the principal sales and service centers from which we provide our environmental, energy and industrial services. The active hazardous waste management properties include incinerator facilities, commercial and non-commercial landfills, wastewater treatment facilities, TSDFs, solvent recovery management and recycling facilities, oil accumulation centers, oil terminals and oil re-refineries. Some of our properties offer multiple capabilities. The following sets forth certain information as of December 31, 2019 regarding our properties.

Service Centers, Satellite Locations and Branches

We have approximately 360 service centers, satellite locations and branches throughout the United States and Canada which serve as principal sales and service centers from which we provide parts cleaning services, containerized waste services, oil collection services and other environmental services.

Active Hazardous Waste Management Properties

Incinerator Facilities. We own five operating incinerator facilities that have a total of nine incinerators with 561,721 tons of total practical capacity and an overall average utilization rate for 2019 of 84.6%. Our practical capacity is not based on a theoretical 24-hour, seven-day operation, but rather is determined as the production level at which our incinerators can operate with an acceptable degree of efficiency, taking into consideration factors such as longer term customer demand, permanent staffing levels, operating shifts, holidays, scheduled maintenance and mix of product. Capacity utilization is calculated by dividing actual production tons by practical capacity at each incinerator.

	# of Incinerators	Practical Capacity (Tons)	Utilization Rate Year Ended December 31, 2019
Arkansas	3	145,072	88.8%
Nebraska	1	58,808	87.9%
Utah	1	66,815	88.4%
Texas	3	165,500	78.9%
Ontario, Canada	1	125,526	83.5%
	9	561,721	84.6%

Our incinerators offer a wide range of technological capabilities to customers through this network. We provide incineration in the United States through one fluidized bed thermal oxidation unit and three solids and liquids-capable incinerator facilities and we operate in Canada one active hazardous waste liquid injection incinerator.

Commercial and Non-Commercial Landfills. In the United States and Canada, we operate nine commercial landfills with approximately 28.2 million cubic yards of remaining highly probable airspace. Seven of our commercial landfills are designed and permitted for the disposal of hazardous waste and two landfills are operated for nonhazardous industrial waste disposal and, to a lesser extent, municipal solid waste. In addition to our commercial landfills, we also own and operate two non-commercial landfills that only accept waste from our on-site incinerators. See "Landfill Accounting" within Note 2, "Significant Accounting Policies," to our consolidated financial statements included in Item 8 of this report for additional information on our commercial and non-commercial landfills.

Wastewater Treatment Facilities. We operate a total of nine facilities, of which eight are owned and one is leased, that offer a range of wastewater treatment technologies and services. Wastewater treatment consists primarily of three types of services: hazardous wastewater treatment, sludge de-watering or drying and non-hazardous wastewater treatment.

Treatment, Storage and Disposal Facilities. We operate 18 TSDFs, of which 16 are owned and two are leased, in the United States and Canada. Our TSDFs facilitate the movement of materials among our network of service centers and treatment and disposal facilities. Transportation may be accomplished by truck, rail, barge or a combination of modes, with our own assets or in conjunction with third-party transporters. Specially designed containment systems, vehicles and other equipment permitted for hazardous and industrial waste transport, together with drivers trained in transportation and waste handling procedures, provide for the movement of customer waste streams.

Solvent Recovery Management and Recycling Operations. We own two facilities specializing in solvent recovery management.

Oil Processing, Blending and Packaging Facilities

Oil Accumulation Centers. We operate a total of nine accumulation centers, of which eight are owned and one is leased, used for accumulating waste oil from our branches.

Oil Terminals. We operate a total of 53 oil terminals, of which 33 are owned and 20 are leased, which collect or process used oil prior to delivery to refineries or distribution as RFO.

Oil Recycling and Re-refining Facilities. We own six oil re-refineries, five in the United States and one in Canada. With more than 200 million gallons of used oil processed annually, we were able to return 191 million gallons of new re-refined oil, lubricants and byproducts back into the marketplace in 2019.

Oil Packaging and Blending Facilities. We operate a total of five oil packaging and blending facilities, of which three are owned and two are leased, which are used for blending and packaging oil from our branches.

Lodging Facilities

Lodge Operations. We own and operate six fixed lodges, five of which are in Western Canada and a single lodge in Texas. These lodges are all located on sites which are leased by the Company under long-term land lease agreements.

Camps. We operate various camp facilities that can grow and shrink in size and location. Generally, we have ongoing operations at one to two larger facilities that we expect to operate on a multi-year basis. Additionally, we have five office complexes, two mini-camps and approximately 20 single and double occupancy drill camps in our fleet that can operate at any time. All of our camp facilities are owned and located on various sites throughout Western Canada. Sites for the larger facilities are generally leased, whereas sites for our smaller facilities are generally provided by our customers.

ITEM 3. LEGAL PROCEEDINGS

See Note 18, "Commitments and Contingencies," to our consolidated financial statements included in Item 8 of this report for a description of legal proceedings.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Common Stock

Our common stock trades on the New York Stock Exchange ("NYSE") under the symbol CLH. On February 19, 2020, there were 261 stockholders of record of our common stock, excluding stockholders whose shares were held in nominee, or "street name" accounts through brokers or banks. On our last record date, 21,644 additional stockholders beneficially held shares in street name accounts.

We have never declared nor paid any cash dividends on our common stock, and we do not intend to pay any dividends on our common stock in the foreseeable future. We intend to retain our future earnings, if any, for use in the operation and expansion of our business, payment of our outstanding debt and for our stock repurchase program. In addition, our current credit agreement and indentures limit the amount we could pay as cash dividends on or for repurchase of our common stock. For additional information surrounding our stock repurchase program, see Note 15, "Stockholders' Equity," to our consolidated financial statements included in Item 8 of this report.

Securities Authorized For Issuance Under Equity Compensation Plans

See Item 12, "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters," for a description of the securities which are authorized for issuance under our equity compensation plans.

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased ⁽¹⁾	Average Price Paid Per Share ⁽²⁾	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs ⁽³⁾ (in thousands)
October 1, 2019 through October 31, 2019	617	\$ 74.78	—	\$ 289,684
November 1, 2019 through November 30, 2019	21,966	83.36	19,000	288,095
December 1, 2019 through December 31, 2019	59,899	84.27	40,329	284,684
Total	82,482	\$ 83.95	59,329	

(1) Includes 23,153 shares withheld by us from employees to satisfy employee tax obligations upon vesting of restricted shares granted under our long-term equity incentive programs.

(2) The average price paid per share of common stock repurchased under our stock repurchase program includes commissions paid to the brokers.

(3) Our board of directors has authorized the repurchase of up to \$600.0 million of our common stock. We have funded and intend to fund the repurchases through available cash resources. The stock repurchase program authorizes us to purchase our common stock on the open market or in privately negotiated transactions periodically in a manner that complies with applicable U.S. securities laws. The number of shares purchased and the timing of the purchases has depended and will depend on a number of factors, including share price, cash required for business plans, trading volume and other conditions. During April 2018, we implemented a repurchase plan in accordance with Rule 10b5-1 promulgated under the Securities Exchange Act of 1934, as amended. Future repurchases will be made under the Rule 10b5-1 plan as well as open market or privately negotiated transactions as described above. We have no obligation to repurchase stock under this program and may suspend or terminate the repurchase program at any time.

COMPARISON OF 5-YEAR CUMULATIVE TOTAL RETURN

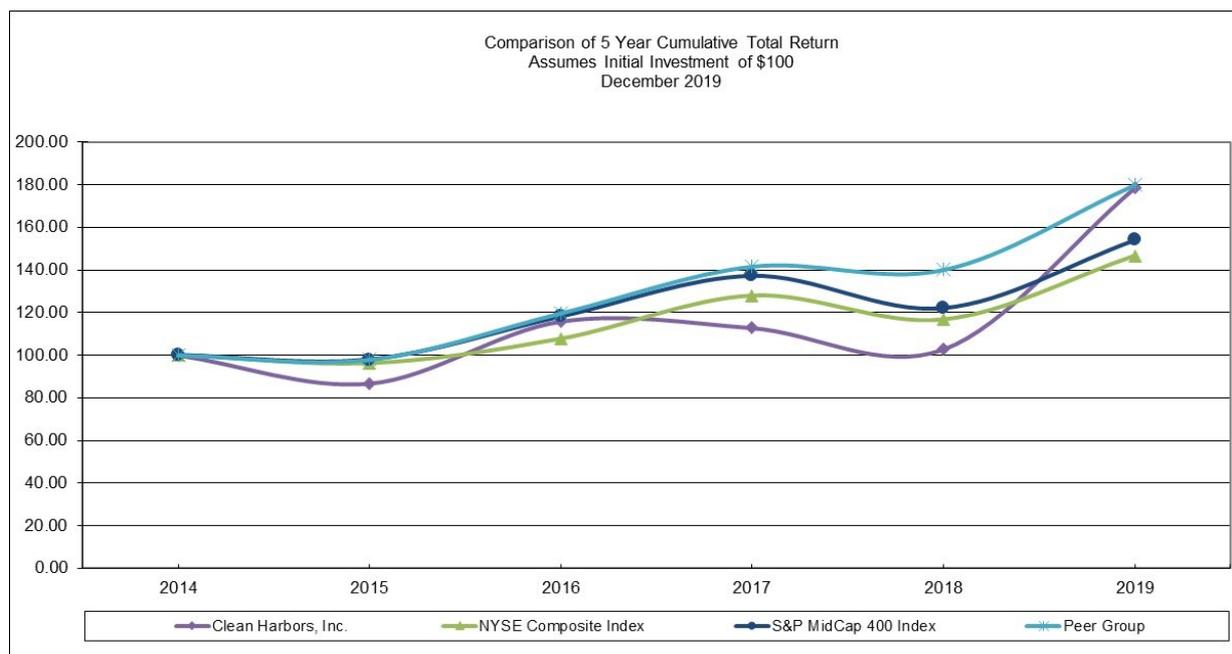
AMONG CLEAN HARBORS, INC.,

NYSE COMPOSITE INDEX, S&P MIDCAP 400 INDEX, REFUSE SYSTEMS AND CUSTOM PEER GROUP

Performance Graph

The following graph compares the five-year return from investing \$100 in each of our common stock, the NYSE Composite Index, the S&P Midcap 400 Index, and a custom peer group. In 2018, we selected a custom peer group that more closely aligns with the breadth and size of our business. This peer group is comprised of American Water Works Company, Inc., Casella Waste Systems, Inc., Civeo Corporation, Covanta Holding Corporation, Heritage-Crystal Clean, Inc., Iron Mountain Incorporated, Newpark Resources, Inc., Oil States International, Inc., Republic Services, Inc., Stericycle, Inc., Superior Energy Services, Inc., US Ecology, Inc., and Waste Management, Inc. In 2019, we removed the Refuse Systems comparative, which had previously been included in the Comparison of 5-Year Cumulative Total Return chart below, because we believe our custom peer group is more relevant.

The values illustrated assume reinvestment of dividends on the ex-dividend date and compares relative performance since a particular starting date. In this instance, the starting date was December 31, 2014, when our common stock closed at \$48.05 per share. The graph is presented pursuant to SEC rules and is not meant to be an indication of our future performance.



ITEM 6. SELECTED FINANCIAL DATA

The following summary of consolidated financial information has been derived from the audited consolidated financial statements included in Item 8, "Financial Statements and Supplementary Data," of this report and in the Form 10-Ks we previously filed with the SEC. This information should be reviewed in conjunction with Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," and the financial statements and notes thereto included in Item 8, "Financial Statements and Supplementary Data," of this report.

(in thousands, except per share amounts)	For the years ended December 31,				
	2019	2018	2017	2016	2015
Statement of Operations Data:					
Total revenues	\$ 3,412,190	\$ 3,300,303	\$ 2,944,978	\$ 2,755,226	\$ 3,275,137
Net income (loss) ⁽¹⁾	97,740	65,636	100,739	(39,873)	44,102
Earnings (loss) per share: ⁽¹⁾					
Basic	1.75	1.17	1.77	(0.69)	0.76
Diluted	1.74	1.16	1.76	(0.69)	0.76
Other Financial Data:					
Adjusted EBITDA ⁽²⁾	540,317	491,005	425,657	400,354	504,167

(in thousands)	As of December 31,				
	2019	2018	2017	2016	2015
Balance Sheet Data:					
Total assets	\$ 4,108,904	\$ 3,738,321	\$ 3,706,570	\$ 3,681,920	\$ 3,431,428
Long-term obligations (including current portion)	1,561,651	1,572,556	1,629,537	1,633,272	1,382,543
Stockholders' equity	1,269,813	1,169,756	1,188,202	1,084,241	1,096,282

- (1) The 2019 results include a \$6.1 million pre-tax loss on early extinguishment of debt and a \$0.7 million gain on the sale of a non-core line of business within our Environmental Services segment. The 2018 results include a \$2.5 million pre-tax loss on early extinguishment of debt. The 2017 results include a net benefit of \$93.0 million resulting from impacts of the tax law changes enacted in December of 2017, a \$7.9 million pre-tax loss on early extinguishment of debt and a \$30.7 million pre-tax gain on the sale of a non-core line of business within our Environmental Services segment. The 2016 results include a \$34.0 million goodwill impairment charge and a \$16.9 million pre-tax gain on the sale of a non-core line of business within our Environmental Services segment. The 2015 results include a \$32.0 million goodwill impairment charge in our Environmental Services segment. In 2016, we did not record any income tax benefit as a result of the goodwill impairment charge. In 2015, we recorded an income tax benefit of \$2.0 million as a result of the goodwill impairment charge.
- (2) The following is a reconciliation of net income (loss) to Adjusted EBITDA for the following periods (in thousands). See additional information regarding this non-GAAP measure under the heading "Adjusted EBITDA" in Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," of this report.

(in thousands, except for percentages)	For the years ended December 31,				
	2019	2018	2017	2016	2015
Net income (loss)	\$ 97,740	\$ 65,636	\$ 100,739	\$ (39,873)	\$ 44,102
Accretion of environmental liabilities	10,136	9,806	9,460	10,177	10,402
Depreciation and amortization	300,725	298,625	288,422	287,002	274,194
Goodwill impairment charges	—	—	—	34,013	31,992
Other (income) expense, net	(2,897)	4,510	6,119	(6,195)	1,380
Loss on early extinguishment of debt	6,131	2,488	7,891	—	—
Gain on sale of businesses	(687)	—	(30,732)	(16,884)	—
Interest expense, net	78,670	81,094	85,808	83,525	76,553
Provision (benefit) for income taxes	50,499	28,846	(42,050)	48,589	65,544
Adjusted EBITDA	\$ 540,317	\$ 491,005	\$ 425,657	\$ 400,354	\$ 504,167
As a percentage of total revenues	15.8%	14.9%	14.5%	14.5%	15.4%

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

Overview

We are North America's leading provider of environmental, energy and industrial services supporting our customers in finding environmentally responsible solutions to further their sustainability goals in today's world. We believe we operate, in the aggregate, the largest number of hazardous waste incinerators, landfills and treatment, storage and disposal facilities ("TSDFs") in North America. We serve a diverse customer base, including Fortune 500 companies, across the chemical, energy, manufacturing and additional markets, as well as numerous government agencies. These customers rely on us to deliver a broad range of services including but not limited to end-to-end hazardous waste management, emergency response, industrial cleaning and maintenance and recycling services. We are also the largest re-refiner and recycler of used oil in North America and the largest provider of parts cleaning and related environmental services to commercial, industrial and automotive customers in North America.

We have two operating segments; (i) the Environmental Services segment and (ii) the Safety-Kleen segment. Performance of our segments is evaluated on several factors of which the primary financial measure is Adjusted EBITDA as described more fully below. The following is a discussion of how management evaluates its segments including key performance indicators that management uses to assess the segments' results, as well as certain macroeconomic trends and influences that impact each reportable segment:

- **Environmental Services** - Environmental Services segment results are predicated upon the demand by our customers for waste services directly attributable to waste volumes generated by them and project work for which waste handling and/or disposal is required. In managing the business and evaluating performance, management tracks the volumes and mix of waste handled and disposed of through our owned incinerators and landfills, as well as utilization of such incinerators, labor and billable hours and equipment among other key metrics. Levels of activity and ultimate performance associated with this segment can be impacted by several factors including overall U.S. GDP and U.S. industrial production, weather conditions, efficiency of our operations, technology, changing regulations, competition, market pricing of our services and the management of our related operating costs. Environmental Services results are also impacted by the demand for planned and unplanned industrial related cleaning and maintenance services at customer sites and for environmental cleanup services on a scheduled or emergency basis, including response to national events such as major chemical spills, natural disasters or other events where immediate and specialized services are required.
- **Safety-Kleen** - Safety-Kleen segment results are impacted by an array of core service and product offerings that serve to attract small quantity waste producers as customers and integrate them into the Clean Harbors waste network. Core service offerings include parts washer services, containerized waste services, vac services, used motor oil collection and contract blending and packaging services. Key performance indicators tracked by the Company relative to these services include the number of parts washer services performed and pricing and volume of used motor oil and waste collected. Results from these services are primarily driven by the overall number of parts washers placed at customer sites and volumes of waste collected, as well as the demand for and frequency of other offered services. These factors can be impacted by overall economic conditions in the marketplace, especially in the automotive related area. In addition to its core service offerings, Safety-Kleen offers high quality recycled base and blended oil products to end users including fleet customers, distributors and manufacturers of oil products. Other product offerings include automotive related fluids and shop supplies. Relative to its oil related products, management tracks the Company's volumes and relative percentages of base and blended oil sales along with various pricing metrics associated with the commodity driven marketplace. The segment's results are significantly impacted by overall market pricing and product mix associated with base and blended oil products and, more specifically, the market prices of Group II base oils. Costs incurred in connection with the collection of used oil and other raw materials associated with the segment's oil related products can also be volatile. Our OilPlus® closed loop initiative, which results in the sale of our renewable oil products directly to our end customers, may also be impacted by changes in customer demand for high-quality, environmentally responsible recycled oil.

Highlights

Total revenues for 2019 increased 3.4% to \$3.4 billion, compared with \$3.3 billion in 2018. Our Environmental Services segment increased direct revenues \$95.9 million in 2019 compared with 2018 due to greater activity at our sales and service branches and improvements in average pricing which was driven by a more profitable mix of waste streams across our incinerator network. Direct revenues recorded by Safety-Kleen increased \$16.8 million in 2019 compared to 2018 as a result of continued growth across Safety-Kleen's core service offerings and higher volumes of blended oil sales. Foreign currency

translation of our Canadian operations negatively impacted our consolidated direct revenues by \$12.9 million in 2019 as compared to 2018.

Income from operations in 2019 was \$229.5 million, compared with \$182.6 million in 2018. We reported net income in 2019 and 2018 of \$97.7 million and \$65.6 million, respectively. Adjusted EBITDA, which is the primary financial measure by which our segments are evaluated, increased 10.0% to \$540.3 million in 2019 from \$491.0 million in 2018. The increased level of Adjusted EBITDA in 2019 was primarily attributable to higher revenue amounts as described above and improved operating margins. Additional information regarding Adjusted EBITDA, which is a non-GAAP measure, including a reconciliation of Adjusted EBITDA to net income, appears below under "*Adjusted EBITDA*."

Net cash from operating activities for 2019 was \$413.2 million, an increase of \$40.0 million from 2018. Adjusted free cash flow, which management uses to measure our financial strength and ability to generate cash, was \$208.5 million in 2019, which represented a \$13.2 million increase over 2018 primarily due to greater levels of operating income and lower levels of working capital, which was due in part to a change in timing of interest payments associated with the debt refinancing completed in the third quarter of 2019. These increases were partially offset by increased capital and environmental spending. Additional information regarding adjusted free cash flow, which is a non-GAAP measure, including a reconciliation of adjusted free cash flow to net cash from operating activities, appears below under "*Adjusted Free Cash Flow*."

Segment Performance

The primary financial measure by which we evaluate the performance of our segments is Adjusted EBITDA. The following table sets forth certain financial information associated with our results of operations for the years ended December 31, 2019, 2018 and 2017 (in thousands, except percentages).

	Summary of Operations						
	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Direct Revenues⁽¹⁾:							
Environmental Services	\$ 2,237,068	\$ 2,141,194	\$ 1,857,474	\$ 95,874	4.5%	\$ 283,720	15.3%
Safety-Kleen	1,178,129	1,161,282	1,087,886	16,847	1.5	73,396	6.7
Corporate Items	(3,007)	(2,173)	(382)	(834)	N/M	(1,791)	N/M
Total	3,412,190	3,300,303	2,944,978	111,887	3.4	355,325	12.1
Cost of Revenues⁽²⁾:							
Environmental Services	1,620,038	1,576,705	1,373,789	43,333	2.7	202,916	14.8
Safety-Kleen	749,407	725,734	690,344	23,673	3.3	35,390	5.1
Corporate Items	18,374	3,112	(1,460)	15,262	N/M	4,572	N/M
Total	2,387,819	2,305,551	2,062,673	82,268	3.6	242,878	11.8
Selling, General and Administrative Expenses:							
Environmental Services	170,746	183,633	162,375	(12,887)	(7.0)	21,258	13.1
Safety-Kleen	146,344	153,519	147,731	(7,175)	(4.7)	5,788	3.9
Corporate Items	166,964	166,595	146,542	369	0.2	20,053	13.7
Total	484,054	503,747	456,648	(19,693)	(3.9)	47,099	10.3
Adjusted EBITDA							
Environmental Services	446,284	380,856	321,310	65,428	17.2	59,546	18.5
Safety-Kleen	282,378	282,029	249,811	349	0.1	32,218	12.9
Corporate Items	(188,345)	(171,880)	(145,464)	(16,465)	(9.6)	(26,416)	(18.2)
Total	\$ 540,317	\$ 491,005	\$ 425,657	\$ 49,312	10.0%	\$ 65,348	15.4%

N/M = not meaningful

(1) Direct revenue is revenue allocated to the segment performing the provided service.

(2) Cost of revenue is shown exclusive of items presented separately on the consolidated statements of operations, which consist of (i) accretion of environmental liabilities and (ii) depreciation and amortization.

Direct Revenues

There are many factors which have impacted and continue to impact our revenues. These factors include, but are not limited to: overall industrial activity and growth in North America, existence or non-existence of large scale environmental waste and remediation projects, competitive industry pricing, impacts of acquisitions and divestitures, the level of emergency response projects, base and blended oil pricing, market changes relative to the collection of used oil, the number of parts washers placed at customer sites and foreign currency translation. In addition, customer efforts to minimize hazardous waste and changes in regulation can also impact our revenues.

Environmental Services

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
	Direct revenues	\$ 2,237,068	\$ 2,141,194	\$ 1,857,474	\$ 95,874	4.5%	\$ 283,720

Environmental Services direct revenues for the year ended December 31, 2019 increased \$95.9 million from the comparable period in 2018. Greater levels of activity at our sales and service branches and improved average pricing for

disposal of waste streams at our incinerators drove this increase in 2019. Service related revenues increased, in part, due to \$15.1 million of emergency response work associated with Field and Emergency Response revenue streams during 2019, compared to \$9.8 million during 2018. Despite a higher number of down days at our Deer Park facility in Q1 2019 as a result of a fire at a neighboring facility, utilization at our incinerator facilities in 2019 remained relatively consistent with the prior year at approximately 85%. A mix of higher priced waste streams resulted in an increase in direct revenues from our incinerator facilities year over year. Average price per ton increased approximately 11% from the prior year for a \$35.1 million increase in direct revenues in 2019. These increases were partially offset by a decrease in Industrial Services revenue as we continue to focus on selecting higher margin turnaround projects. Also impacting the year over year change in direct revenues within this segment was the negative impact of foreign currency translation on our Canadian operations of \$9.3 million.

Environmental Services direct revenues for the year ended December 31, 2018 increased \$283.7 million from the comparable period in 2017. Included in the current year revenues was \$154.0 million of direct revenues from the Veolia Business, which we acquired on February 23, 2018. Excluding the impacts from the Veolia Business, Environmental Services direct revenues increased \$129.5 million primarily due to greater levels of activity at our sales and service branches and increased levels of disposal related revenues from improved pricing conditions and mix associated with waste streams at our incinerators in 2018. For the year ended December 31, 2018, landfill volumes increased slightly as compared to 2017. The utilization rate at our incinerators was 86.7% on a practical capacity of 561,721 tons for the year ended December 31, 2018, compared with 87.6% on a practical capacity of 561,721 tons in 2017. The decrease in utilization rates in 2018 was impacted by a slightly higher number of down days at our facilities during 2018; however, impacts on the profitability of the business from an increase in down days was more than offset by improved pricing conditions and an increase in volumes of higher margin waste streams received in 2018. The impact of foreign currency translation on our Canadian operations within the Environmental Services segment was minimal in the year ended December 31, 2018 as compared to 2017.

Safety-Kleen

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Direct revenues	\$ 1,178,129	\$ 1,161,282	\$ 1,087,886	\$ 16,847	1.5%	\$ 73,396	6.7%

Safety-Kleen direct revenues for the year ended December 31, 2019 increased \$16.8 million from the comparable period in 2018 primarily due to growth in the business' core service offerings and increased blended oil volumes. Revenues generated through our core service offerings, such as handling of containerized waste and vacuum services, accounted for \$22.3 million of incremental revenues driven both by volume and pricing increases. Higher volumes of blended oil sales and increased pricing of our used motor oil collections contributed \$15.6 million and \$5.2 million, respectively, to the growth in direct revenues from the comparable period in 2018. Revenue from contract blending and packaging also increased \$9.3 million due to increased volume. These increases were partially offset by a \$17.5 million decrease in base oil sales due to reductions in pricing experienced in 2019 in response to lower demand across the base oil market and lower base oil volumes, most significantly seen in the first quarter of 2019. Sales of recycled fuel oil and refinery bi-products decreased by \$12.3 million from prior year due to a reduction in volume. In 2019, parts washer services were relatively consistent with the prior year. Also included in the change within this segment was the negative impact of foreign currency translation on our Canadian operations of \$3.4 million.

Safety-Kleen direct revenues for the year ended December 31, 2018 increased \$73.4 million from the comparable period in 2017 primarily due to more favorable pricing on oil products and growth in the business' core service offerings. Revenues generated through our core service offerings such as handling of containerized waste and vac services, parts washer services as well as sales of automotive and industrial cleaning products accounted for \$21.3 million of incremental revenues. Increased base and blended volumes and oil pricing accounted for \$34.7 million of incremental direct revenues from the comparable period in 2017. Sales of contract packaging and blending services, refinery bi-products and recycled fuel oil also increased by \$38.9 million from the comparable period in 2017. These increases were partially offset by a decrease in used motor oil collection revenues of \$19.5 million as market pricing for these services was negatively impacted as crude oil prices generally rose throughout the earlier parts of 2018. The impact of foreign currency translation on our Canadian operations within the Safety-Kleen segment was minimal in the year ended December 31, 2018 as compared to 2017.

Cost of Revenues

We believe that our ability to manage operating costs is important to our ability to remain price competitive. We continue to upgrade the quality and efficiency of our services through the development of new technology and continued modifications at our facilities, invest in new business opportunities and aggressively implement strategic sourcing and logistics solutions as well as other cost reduction initiatives while also continuing to optimize our management and operating structure in an effort to

maintain and increase operating margins. These strategic cost saving actions help to reduce the impacts of naturally rising costs such as labor and other core operating costs across our businesses.

Environmental Services

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Cost of revenues	\$ 1,620,038	\$1,576,705	\$1,373,789	\$ 43,333	2.7 %	\$ 202,916	14.8 %
As a % of Direct revenues	72.4%	73.6%	74.0%		(1.2)%		(0.4)%

Environmental Services cost of revenues increased \$43.3 million for the year ended December 31, 2019, however these costs decreased as a percentage of direct revenue due to a mix of higher priced waste streams in our incineration network, which increased profitability, and the results of ongoing cost reduction projects, including site consolidations. The overall cost increase was due to compensation and benefits related costs, equipment and supply costs and transportation, outside disposal and fuel costs which increased \$20.4 million, \$11.4 million and \$3.9 million, respectively. The incremental operating costs were commensurate with greater activity levels in 2019.

Environmental Services cost of revenues for the year ended December 31, 2018 increased \$202.9 million from the comparable period in 2017. The acquired Veolia Business had cost of revenues of \$131.2 million in the year ended December 31, 2018. Excluding these costs, Environmental Services cost of revenues for the year ended December 31, 2018 increased \$71.7 million, however these costs as a percentage of direct revenues decreased slightly over the comparable period of 2017, due to a more favorable mix of waste streams in our incineration network which increased profitability. The overall cost increase was due to labor and benefit related costs, transportation, disposal and fuel costs, and equipment, supply and various other expenses of \$45.4 million, \$16.2 million and \$10.0 million, respectively. The incremental operating costs were commensurate with greater activity levels in 2018 and overall inflationary pressure across several cost categories including certain commodity supplies such as fuel and other supplies.

Safety-Kleen

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Cost of revenues	\$ 749,407	\$ 725,734	\$ 690,344	\$ 23,673	3.3%	\$ 35,390	5.1 %
As a % of Direct revenues	63.6%	62.5%	63.5%		1.1%		(1.0)%

Safety-Kleen cost of revenues for the year ended December 31, 2019 increased \$23.7 million from the comparable period in 2018. As a percentage of direct revenues, these costs increased as well mainly due to lower average pricing on the oil products sold leading to reduced leverage of our fixed cost base. Increased logistics costs, largely due to weather at the beginning of the year, also negatively impacted costs as a percentage of direct revenues. The overall cost increase was due to higher compensation and benefits related costs of \$8.5 million, raw material costs associated with blended oil products of \$5.5 million and transportation, disposal and fuel costs of \$2.7 million. These increases were in line with the overall growth of our core service offerings and blended oil sales.

Safety-Kleen cost of revenues for the year ended December 31, 2018 increased \$35.4 million from the comparable period in 2017, however these costs decreased as a percentage of revenue due to our effective management of the spread between used oil input costs and base oil pricing, as well as the implementation of new pricing strategies, which generated greater levels of direct revenue. The overall cost increase was primarily due to increased costs of raw materials associated with oil products of \$15.8 million, increased transportation, disposal and fuel costs of \$12.3 million and labor related costs of \$6.3 million. These increases were in line with the overall growth of the business and increased costs of commodities.

Selling, General and Administrative Expenses

We strive to manage our selling, general and administrative ("SG&A") expenses commensurate with the overall performance of our segments and corresponding revenue levels. We believe that our ability to properly align these costs with business performance is reflective of our strong management of the businesses and further promotes our ability to remain competitive in the marketplace.

Environmental Services

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$	%	\$	%
				Change	Change	Change	Change
SG&A expenses	\$ 170,746	\$ 183,633	\$ 162,375	\$ (12,887)	(7.0)%	\$ 21,258	13.1 %
As a % of Direct revenues	7.6%	8.6%	8.7%		(1.0)%		(0.1)%

Environmental Services SG&A expenses for the year ended December 31, 2019 decreased \$12.9 million from the comparable period in 2018 and SG&A as a percentage of direct revenue decreased as well. The primary driver of these decreases relates to certain trade receivables which were reserved for in 2018 and subsequently recovered in 2019, generating a favorable difference of nearly \$13.0 million. The favorable resolution of a litigation matter further reduced SG&A expenses by \$5.5 million in 2019. These decreases were partially offset by a \$5.2 million increase in compensation and benefits related costs which was consistent with the growth of the business in 2019. Excluding the recovery of trade receivables and litigation impacts, 2019 SG&A expenses as a percentage of direct revenues still improved over the prior year.

Environmental Services SG&A expenses for the year ended December 31, 2018 increased \$21.3 million from the comparable period in 2017, however as a percentage of direct revenues, these costs remained consistent between the two periods. The increase in SG&A expenses was primarily due to increases in salary, benefits and variable compensation related costs of \$14.7 million and bad debt expense of \$7.0 million, partially offset by cost reductions across various expense categories. The increases in salary, benefits and variable compensation are in line with the growth of the business in 2018 as compared to 2017.

Safety-Kleen

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$	%	\$	%
				Change	Change	Change	Change
SG&A expenses	\$ 146,344	\$ 153,519	\$ 147,731	\$ (7,175)	(4.7)%	\$ 5,788	3.9 %
As a % of Direct revenues	12.4%	13.2%	13.6%		(0.8)%		(0.4)%

Safety-Kleen SG&A expenses for the year ended December 31, 2019 decreased \$7.2 million from the comparable period in 2018 and SG&A as a percentage of direct revenues decreased as well. The primary driver of these decreases is a \$4.4 million decrease in compensation and benefits related costs resulting from lower headcount and cost saving initiatives implemented by the business throughout 2019. A reduction in legal related costs of \$1.6 million also contributed to the overall decrease in SG&A expenses.

Safety-Kleen SG&A expenses for the year ended December 31, 2018 increased \$5.8 million from the comparable period in 2017, however these costs decreased as a percentage of direct revenues, as the additional direct revenues outpaced incremental SG&A expenses. The overall increase in SG&A expenses was primarily due to increased salaries, benefits and variable compensation of \$5.7 million as we continue to grow the business.

Corporate Items

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$	%	\$	%
				Change	Change	Change	Change
SG&A expenses	\$ 166,964	\$ 166,595	\$ 146,542	\$ 369	0.2%	\$ 20,053	13.7%

Corporate Items SG&A expenses for the year ended December 31, 2019 were consistent with the comparable period in 2018. Continued investment in our employees increased our compensation and benefits related costs by \$6.6 million and stock-based compensation increased by \$1.0 million due to the achievement of certain performance metrics associated with performance based awards. These costs were offset by a \$6.9 million reduction in legal and consulting fees due to cost saving initiatives.

Corporate Items SG&A expenses for the year ended December 31, 2018 increased \$20.1 million from the comparable period in 2017 primarily due to increased salaries and benefits resulting from continued commitments to investing in our employees and variable compensation totaling \$14.8 million, as well as increased stock-based compensation of \$4.3 million primarily attributable to the achievement of performance metrics associated with performance based awards in 2018. Incremental costs associated with the acquired Veolia Business also contributed to the increased costs.

Adjusted EBITDA

Management considers Adjusted EBITDA to be a measurement of performance which provides useful information to both management and investors. Adjusted EBITDA should not be considered an alternative to net income or other measurements under generally accepted accounting principles ("GAAP"). Adjusted EBITDA is not calculated identically by all companies and, therefore our measurements of Adjusted EBITDA, while defined consistently and in accordance with our existing credit agreement, may not be comparable to similarly titled measures reported by other companies.

We use Adjusted EBITDA to enhance our understanding of our operating performance, which represents our views concerning our performance in the ordinary, ongoing and customary course of our operations. We historically have found it helpful, and believe that investors have found it helpful, to consider an operating measure that excludes certain expenses relating to transactions not reflective of our core operations.

The information about our operating performance provided by this financial measure is used by our management for a variety of purposes. We regularly communicate Adjusted EBITDA results to our lenders since our loan covenants are based upon levels of Adjusted EBITDA achieved and to our board of directors and we discuss with the board our interpretation of such results. We also compare our Adjusted EBITDA performance against internal targets as a key factor in determining cash and equity bonus compensation for executives and other employees, largely because we believe that this measure is indicative of how the fundamental business is performing and is being managed.

We also provide information relating to our Adjusted EBITDA so that analysts, investors and other interested persons have the same data that we use to assess our core operating performance. We believe that Adjusted EBITDA should be viewed only as a supplement to the GAAP financial information. We also believe, however, that providing this information in addition to, and together with, GAAP financial information provides a better understanding of our core operating performance and how management evaluates and measures our performance.

The following is a reconciliation of net income to Adjusted EBITDA for the following periods (in thousands, except percentages):

	For the years ended December 31,		
	2019	2018	2017
Net income	\$ 97,740	\$ 65,636	\$ 100,739
Accretion of environmental liabilities	10,136	9,806	9,460
Depreciation and amortization	300,725	298,625	288,422
Other (income) expense, net	(2,897)	4,510	6,119
Loss on early extinguishment of debt	6,131	2,488	7,891
Gain on sale of businesses	(687)	—	(30,732)
Interest expense, net	78,670	81,094	85,808
Provision (benefit) for income taxes	50,499	28,846	(42,050)
Adjusted EBITDA	\$ 540,317	\$ 491,005	\$ 425,657
As a % of Direct revenues	15.8%	14.9%	14.5%

Depreciation and Amortization

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Depreciation of fixed assets and amortization of landfills and finance leases	\$ 265,531	\$ 264,254	\$ 251,403	\$ 1,277	0.5%	\$ 12,851	5.1%
Permits and other intangibles amortization	35,194	34,371	37,019	823	2.4%	(2,648)	(7.2)%
Total depreciation and amortization	\$ 300,725	\$ 298,625	\$ 288,422	\$ 2,100	0.7%	\$ 10,203	3.5%

Depreciation and amortization for the year ended December 31, 2019 remained relatively consistent with the same period in the prior year. Depreciation and amortization for the year ended December 31, 2018 increased \$10.2 million from the comparable period in 2017, primarily due to incremental depreciation from acquisitions and a slight increase in volumes at our landfills that drove higher landfill amortization.

Other Income (Expense), net

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Other income (expense), net	\$ 2,897	\$ (4,510)	\$ (6,119)	\$ 7,407	(164.2)%	\$ 1,609	(26.3)%

For the year ended December 31, 2019, other income (expense), net increased \$7.4 million from the comparable period in 2018 primarily due to insurance proceeds received in 2019 and smaller comparative losses recognized on sales or disposals of fixed assets. Other income (expense), net increased \$1.6 million from 2017 to 2018 primarily due to smaller losses recognized on sales or disposals of fixed assets in 2018.

Loss on Early Extinguishment of Debt

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Loss on early extinguishment of debt	\$ (6,131)	\$ (2,488)	\$ (7,891)	\$ (3,643)	146%	\$ 5,403	(68.5)%

During the year ended December 31, 2019, we recorded a \$6.1 million loss on early extinguishment of debt in connection with the extinguishment of \$845.0 million of unsecured senior notes due 2021 which were repaid during the current year. During the year ended December 31, 2018, we recorded a \$2.5 million loss on early extinguishment of debt in connection with the extinguishment of the remaining \$400.0 million previously outstanding senior unsecured notes. During the year ended December 31, 2017, we recorded a \$7.9 million loss on early extinguishment of debt in connection with the extinguishment of \$400.0 million of the previously outstanding senior unsecured notes. The losses recognized in each of these years consisted of amounts paid in excess of par in order to extinguish the debt prior to maturity and non-cash expenses related to the write-off of unamortized financing costs. For additional information regarding our financing arrangements, see Note 12, "Financing Arrangements," under Item 8, "Financial Statements and Supplementary Data," of this report.

Gain on Sale of Businesses

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Gain on sale of businesses	\$ 687	\$ —	\$ 30,732	\$ 687	N/M	\$ (30,732)	N/M

During the year ended December 31, 2019, we recorded a \$0.7 million gain on the sale of a non-core business within our Environmental Services segment. During the year ended December 31, 2017, we recorded a \$30.7 million gain on the sale of our Transformer Services business which had been part of our Environmental Services segment. For additional information regarding these gains on sale of businesses, see Note 5, "Disposition of Businesses," under Item 8, "Financial Statements and Supplementary Data," of this report.

Provision (Benefit) for Income Taxes

(in thousands, except percentages)	For the years ended December 31,			2019 over 2018		2018 over 2017	
	2019	2018	2017	\$ Change	% Change	\$ Change	% Change
Provision (benefit) for income taxes	\$ 50,499	\$ 28,846	\$ (42,050)	\$ 21,653	75.1%	\$ 70,896	(168.6)%

For the year ended December 31, 2019, provision for income taxes increased \$21.7 million from the comparable period in 2018 due to higher earnings in the United States and the impact from a nonrecurring \$9.8 million benefit recognized in 2018 related to the filing of then current and amended prior year tax returns in that year. The effective tax rate for 2019 was 34.1% as compared to 30.5% in the prior year.

The income tax benefit in 2017 was primarily driven by impacts from the enactment of the Tax Cuts and Jobs Act (the "Tax Act") signed into law in December 2017. Impacts of the Tax Act resulted in a net benefit of \$93.0 million being recorded in 2017. Excluding the impacts of the Tax Act, a provision of \$51.0 million would have been recognized.

Liquidity and Capital Resources

(in thousands)	For the years ended December 31,		
	2019	2018	2017
Net cash from operating activities	\$ 413,192	\$ 373,210	\$ 285,698
Net cash used in investing activities	(217,856)	(349,659)	(203,267)
Net cash used in financing activities	(53,425)	(110,997)	(72,760)

Net cash from operating activities

Net cash from operating activities for the year ended December 31, 2019 was \$413.2 million, an increase of \$40.0 million compared to the year ended December 31, 2018. The increase was most directly attributable to greater levels of operating income and lower working capital, partially offset by an increase in environmental spending. The reduction in working capital was primarily attributable to the timing of interest payments associated with the debt refinancing completed in the third quarter of 2019. Refinancing this debt changed the timing of our related interest payments from June and December to January and July.

Net cash from operating activities for the year ended December 31, 2018 was \$373.2 million, an increase of \$87.5 million compared to the year ended December 31, 2017. The increase was most directly attributable to greater levels of operating income, lower interest payments and a reduction in environmental expenditures, which was offset by higher working capital levels due to overall growth in our business.

Net cash used in investing activities

Net cash used in investing activities for the year ended December 31, 2019 was \$217.9 million, a decrease of \$131.8 million compared to the year ended December 31, 2018. This decrease was due to less cash used to fund acquisitions in 2019 and an increase in net proceeds from sales of marketable securities, partially offset by \$26.8 million of increased capital expenditure levels, net of proceeds, primarily due to 2019 investments in facility upgrades and landfill spending.

Net cash used in investing activities for the year ended December 31, 2018 was \$349.7 million, an increase of \$146.4 million compared to the year ended December 31, 2017. The change was primarily driven by the 2018 use of cash to fund acquisitions, increased capital expenditure levels net of proceeds primarily related to sales of manufacturing assets in Western Canada, a reduction in net purchases of marketable securities and the lack in 2018 of proceeds from sale of a business, which occurred in 2017 with the Transformer Services divestiture.

Net cash used in financing activities

Net cash used in financing activities for the year ended December 31, 2019 was \$53.4 million, a decrease of \$57.6 million compared to the year ended December 31, 2018. The decrease was primarily driven by a \$50.0 million reduction in net principal payments on debt obligations in 2019 and a \$23.7 million decrease in repurchases of common stock, partially offset by increased outflows for deferred financing costs associated with debt refinancing activities in 2019 of \$6.1 million, tax payments related to withholdings on vested restricted stock of \$4.2 million and changes in uncashed checks of \$3.8 million.

Net cash used in financing activities for the year ended December 31, 2018 was \$111.0 million, an increase of \$38.2 million compared to the year ended December 31, 2017. The primary reason for the increase in 2018 was the increase in funds used for the net pay down of debt obligations totaling \$55.8 million which occurred during the year. Offsetting this increase was decreased outflows related to stock repurchases of \$3.9 million, premiums paid on the extinguishment of debt of \$4.8 million, and changes in uncashed checks of \$5.8 million.

Adjusted Free Cash Flow

Management considers adjusted free cash flow to be a measure of liquidity which provides useful information to both management, creditors and investors about our financial strength and our ability to generate cash. Additionally, adjusted free cash flow is a metric on which a portion of management incentive compensation is based. We define adjusted free cash flow as net cash from operating activities excluding cash impacts of items derived from non-operating activities, such as taxes paid in connection with divestitures, less additions to property, plant and equipment plus proceeds from sales or disposals of fixed assets. Adjusted free cash flow should not be considered an alternative to net cash from operating activities or other measurements under GAAP. Adjusted free cash flow is not calculated identically by all companies, and therefore our measurements of adjusted free cash flow may not be comparable to similarly titled measures reported by other companies.

The following is a reconciliation from net cash from operating activities to adjusted free cash flow for the following periods (in thousands):

	For the years ended December 31,		
	2019	2018	2017
Net cash from operating activities	\$ 413,192	\$ 373,210	\$ 285,698
Additions to property, plant and equipment	(216,324)	(193,344)	(167,007)
Proceeds from sale and disposal of fixed assets	11,655	15,445	7,124
Tax liability on sale of business	—	—	14,423
Adjusted free cash flow	<u>\$ 208,523</u>	<u>\$ 195,311</u>	<u>\$ 140,238</u>

Summary of Capital Resources

At December 31, 2019, cash and cash equivalents and marketable securities totaled \$414.4 million, compared to \$279.4 million at December 31, 2018. At December 31, 2019, cash and cash equivalents held by foreign subsidiaries totaled \$74.5 million and were readily convertible into other currencies including U.S. Dollars. At December 31, 2019, the cash and cash equivalents and marketable securities balance for our U.S. operations was \$339.9 million, and our U.S. operations had net operating cash flows of \$392.7 million for the year ended December 31, 2019. Additionally, we have a \$400.0 million revolving credit facility, of which approximately \$229.2 million was available to borrow at December 31, 2019. Based on the above and our current plans, we believe that our operations have adequate financial resources to satisfy their current liquidity needs.

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing, and financing activities. Our primary ongoing cash requirements will be to fund operations, capital expenditures, interest payments and investments in line with our business strategy. We believe our future operating cash flows will be sufficient to meet our future operating and internal investing cash needs as well as any cash needs relating to our stock repurchase program. Furthermore, our existing cash balance and the availability of additional borrowings under our revolving credit facility provide additional potential sources of liquidity should they be required.

Financing Arrangements

The financing arrangements and principal terms of our \$545.0 million principal amount of 4.875% senior unsecured notes due 2027 and \$300.0 million principal amount of 5.125% senior unsecured notes due 2029, and \$734.7 million senior secured notes due 2024 which were outstanding at December 31, 2019, and our \$400.0 million revolving credit facility, are discussed further in Note 12, "Financing Arrangements," to our consolidated financial statements included in Item 8 of this report.

As of December 31, 2019, we were in compliance with the covenants of all of our debt agreements, and we believe we will continue to meet such covenants.

Environmental Liabilities

(in thousands)	As of December 31,		2019 over 2018	
	2019	2018	\$ Change	% Change
Closure and post-closure liabilities	\$ 75,651	\$ 69,931	\$ 5,720	8.2 %
Remedial liabilities	114,173	121,017	(6,844)	(5.7)%
Total environmental liabilities	<u>\$ 189,824</u>	<u>\$ 190,948</u>	<u>\$ (1,124)</u>	<u>(0.6)%</u>

Total environmental liabilities as of December 31, 2019 were \$189.8 million, a decrease of \$1.1 million compared to December 31, 2018. This decrease was primarily due to expenditures of \$18.7 million, partially offset by accretion of \$10.1 million, changes in environmental liability estimates recorded to the consolidated balance sheet of \$3.9 million and new asset retirement obligations and liabilities assumed in acquisitions of \$2.9 million.

We anticipate our environmental liabilities, substantially all of which we assumed in connection with our acquisitions, will be payable over many years and that cash flow from operations will generally be sufficient to fund the payment of such liabilities when required. However, events not anticipated (such as future changes in environmental laws and regulations) could require that such payments be made earlier or in greater amounts than currently anticipated, which could adversely affect our results of operations, cash flow and financial condition. Conversely, the development of new treatment technologies or other circumstances may arise in the future which may reduce amounts ultimately paid.

During 2019, 2018 and 2017, we recognized a net benefit of \$0.3 million, net charge of \$2.1 million and net benefit of \$0.2 million, respectively, for changes in estimates of recorded environmental liabilities. Generally, we recognize benefits primarily due to the successful introduction of new technology for remedial activities, favorable results from environmental studies of the on-going remediation, including favorable regulatory approvals and lower project costs realized by utilizing internal labor and equipment. In 2018, the net increase in our environmental liabilities from changes in estimates recorded to the consolidated statement of operations was \$2.1 million and primarily related to an increase in projected cleanup costs at third party Superfund sites where we are a potentially responsible party.

Contractual Obligations

The following table has been included to assist in understanding our debt and similar obligations as of December 31, 2019 and our ability to meet such contractual obligations (in thousands):

	Total	Payments due in			
		Less than 1 year	1-3 years	4-5 years	After 5 years
Closure, post-closure and remedial liabilities ⁽¹⁾	\$ 458,409	\$ 24,300	\$ 51,804	\$ 28,304	\$ 354,001
Current and long-term obligations, at par	1,579,697	7,535	15,071	712,091	845,000
Interest on current and long-term obligations ⁽²⁾	477,233	71,769	142,615	127,127	135,722
Finance leases	65,222	2,733	5,618	5,720	51,151
Operating leases	187,525	50,814	69,757	38,510	28,444
Total contractual obligations	\$ 2,768,086	\$ 157,151	\$ 284,865	\$ 911,752	\$ 1,414,318

(1) The undiscounted value of closure, post-closure and remedial liabilities of \$458.4 million is equivalent to the present value of \$189.8 million based on discounting of \$178.5 million and the undiscounted remainder of \$90.1 million to be accrued for closure and post-closure liabilities over the remaining site lives.

(2) Interest on our variable-rate \$734.7 million senior secured term loans was calculated based on the effective interest rate of that debt as of December 31, 2019. Our interest rate swap agreements effectively fix the interest rate on \$350.0 million of that variable rate debt at an annual rate of approximately 4.67%, while the remaining balance pays interest based upon LIBOR and an applicable margin. The assumed rate reflected in the table above for this variable rate debt after considering the swap agreements is 4.06%.

Off-Balance Sheet Arrangements

We obtain standby letters of credit as security for financial assurances we have been required to provide to regulatory bodies for our hazardous waste facilities and which would be called only in the event that we fail to satisfy closure, post-closure and other obligations under the permits issued by those regulatory bodies for such licensed facilities. As of December 31, 2019, there were \$146.9 million outstanding letters of credit. See Note 12, "Financing Arrangements," to our consolidated financial statements included in Item 8 of this report for further discussion of our standby letters of credit and other financing arrangements.

Except for our obligations under letters of credit described above and performance obligations incurred in the ordinary course of business, we are not party to any off-balance sheet arrangements involving guarantee, contingency or similar obligations to entities whose financial statements are not consolidated with our results, and that have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that would be material to investors in our securities.

Capital Expenditures

In 2019, our capital expenditures, net of disposals, were \$204.7 million. We anticipate that 2020 capital spending, net of disposals, will be in the range of \$215.0 million to \$240.0 million, inclusive of \$20.0 million to \$25.0 million for the purchase of our corporate headquarters in January 2020 and some expected capital improvements to that facility during 2020. However, unanticipated changes in environmental regulations could require us to make significant capital expenditures for our facilities and adversely affect our results of operations and cash flow.

Critical Accounting Policies and Estimates

The preparation of our financial statements requires us to make estimates and judgments that affect the reported amounts of our assets, liabilities, revenues and expenses and related disclosures of contingent liabilities. Our significant accounting policies are discussed in Note 2, "Significant Accounting Policies," to our consolidated financial statements included in Item 8 of this report. We believe that, of our significant accounting policies, the following contain estimates that involve a higher degree of complexity in their application: accounting for landfills, non-landfill closure and post-closure liabilities, remedial liabilities, goodwill, permits and other intangible assets and legal matters. Our management reviews critical accounting estimates with the Audit Committee of our Board of Directors on an ongoing basis and as needed prior to the release of our annual financial statements.

Landfill Accounting. We amortize landfill improvements and certain landfill-related permits over their estimated useful lives. The units-of-consumption method is used to amortize land, landfill cell construction, asset retirement costs and remaining landfill cells and sites. We also utilize the units-of-consumption method to record closure and post-closure obligations for landfill cells and sites. Under the units-of-consumption method, we include future estimated construction and asset retirement costs, as well as costs incurred to date, in the amortization base of the landfill assets. Additionally, where appropriate, as discussed below, we include probable expansion airspace yet to be permitted in the calculation of the total remaining useful life of the landfill. If we determine that expansion capacity should no longer be considered in calculating the recoverability of a landfill asset, we may be required to recognize an asset impairment or incur significantly higher amortization expense. If at any time we decide to abandon the expansion effort, the capitalized costs related to the expansion effort are expensed immediately.

Landfill Assets. Landfill assets include the costs of landfill site acquisition, permits and cell construction incurred to date. These amounts are amortized under the units-of-consumption method such that the asset is completely amortized when the landfill ceases accepting waste.

Landfill Capacity. Landfill capacity, which is the basis for the amortization of landfill assets and for the accrual of final closure and post-closure obligations, represents total permitted airspace plus unpermitted airspace that management believes is probable of ultimately being permitted based on established criteria. Our management applies the following criteria for evaluating the probability of obtaining a permit for future expansion airspace at existing sites, which provides management a basis to evaluate the likelihood of success of unpermitted expansions:

- Personnel are actively working to obtain the permit or permit modifications (land use, state and federal) necessary for expansion of an existing landfill, and progress is being made on the project.
- Management expects to submit the application within the next year and to receive all necessary approvals to accept waste within the next five years.
- At the time the expansion is included in management's estimate of the landfill's useful economic life, it is probable that the required approvals will be received within the normal application and processing time periods for approvals in the jurisdiction in which the landfill is located.
- We have a legal right to use or obtain the right to use the land associated with the expansion plan through title or lease.
- There are no significant known political, technical, legal or business restrictions or other issues that could impair the success of such expansion.
- Management is committed to pursuing the expansion which is supported by a complete financial feasibility analysis which demonstrates that the expansion will have a positive financial and operational impact.
- Additional airspace and related additional costs, including permitting, final closure and post-closure costs have been estimated based on the conceptual design of the proposed expansion.

As of December 31, 2019, there were no unpermitted expansions included in management's landfill calculation. If actual expansion airspace is significantly different from management's estimate of expansion airspace, the amortization rates used for the units-of-consumption method would change, therefore impacting our profitability. If we determine that there is less actual expansion airspace at a landfill, this would increase amortization expense recorded and decrease profitability, while if we determine a landfill has more actual expansion airspace, amortization expense would decrease and profitability would increase.

Landfill Final Closure and Post-Closure Liabilities. The balance of landfill final closure and post-closure liabilities at December 31, 2019 and 2018 was \$39.4 million and \$37.8 million, respectively. We have material financial commitments for the costs associated with requirements of the EPA and the comparable regulatory agency in Canada for landfill final closure and post-closure activities. In the United States, the landfill final closure and post-closure requirements are established under the standards of the EPA, and are implemented and applied on a state-by-state basis. We develop estimates for the cost of these

activities based on our evaluation of site-specific facts and circumstances, such as the existence of structures and other landfill improvements that would need to be dismantled, the amount of groundwater monitoring and leachate management expected to be performed and the length of the post-closure period as determined by the applicable regulatory agency. Included in our cost estimates are our interpretation of current regulatory requirements and proposed regulatory changes. Such estimates may change in the future due to various circumstances including, but not limited to, permit modifications, changes in legislation or regulations, technological changes and results of environmental studies. We perform zero-based reviews of these estimated liabilities based upon a planned schedule, typically every five years or sooner if the occurrence of a significant event is likely to change the timing or amount of the currently estimated expenditures. We consider a significant event to be a new regulation or an amendment to an existing regulation, a new permit or modification to an existing permit or a change in the market price of a significant cost item. Our cost estimates are calculated using internal sources as well as input from third-party experts. These costs are measured at estimated fair value using present value techniques, and therefore changes in the estimated timing of closure and post-closure activities would affect the liability, the value of the related asset and our results of operations.

Final closure costs are the costs incurred after the site ceases to accept waste, but before the landfill is certified as closed by the applicable state or provincial regulatory agency. These costs generally include the costs required to cap the final cell of the landfill (if not included in cell closure), dismantle certain structures for landfills and other landfill improvements and regulation-mandated groundwater monitoring and leachate management. Post-closure costs involve the maintenance and monitoring of a landfill site that has been certified closed by the applicable regulatory agency. These costs generally include groundwater monitoring and leachate management. Regulatory post-closure periods are generally 30 years after landfill closure. Final closure and post-closure obligations are accrued on a units-of-consumption basis, such that the present value of the final closure and post-closure obligations are fully accrued at the date the landfill discontinues accepting waste.

Non-Landfill Closure and Post-Closure Liabilities. The balance of our non-landfill closure and post-closure liabilities at December 31, 2019 and 2018 was \$36.3 million and \$32.1 million, respectively. We base estimates for non-landfill closure and post-closure liabilities on our interpretations of existing permit and regulatory requirements for closure and post-closure maintenance and monitoring. Our cost estimates are calculated using internal sources as well as input from third-party experts. We estimate when future operations will cease and inflate the current cost of closing the non-landfill facility using the appropriate inflation rate and then discounting the future value to arrive at an estimated present value of closure and post-closure costs. The estimates for non-landfill closure and post-closure liabilities are inherently uncertain due to the possibility that permit and regulatory requirements will change in the future, impacting the estimation of total costs and the timing of the expenditures. We review non-landfill closure and post-closure liabilities for changes to key assumptions that would impact the amount of the recorded liabilities. Changes that would prompt us to revise a liability estimate include changes in legal requirements that impact our expected closure plan or scope of work, in the market price of a significant cost item, in estimates as to when future operations may cease or in the expected timing of the cost expenditures. Changes in estimates for non-landfill closure and post-closure events immediately impact the required liability and the value of the corresponding asset. If a change is made to a fully-amortized asset, the adjustment is charged immediately to expense. When a change in estimate relates to an asset that has not been fully amortized, the adjustment to the asset is recognized in income prospectively as a component of amortization. Historically, material changes to non-landfill closure and post-closure estimates have been infrequent. See Note 10, "Closure and Post-Closure Liabilities," to our consolidated financial statements included in Item 8 of this report for the changes to these Landfill and Non-Landfill Closure and Post-Closure liabilities during the years ended December 31, 2018 and 2017.

Remedial Liabilities. The balance of our remedial liabilities at December 31, 2019 and 2018 was \$114.2 million and \$121.0 million, respectively. See Note 11, "Remedial Liabilities," to our consolidated financial statements included in Item 8 of this report for the changes to the remedial liabilities during the years ended December 31, 2019 and 2018. Remedial liabilities are obligations to investigate, alleviate and/or eliminate the effects of a release (or threat of a release) of hazardous substances into the environment and may also include corrective action under RCRA. Our remediation obligations can be further characterized as legal, superfund, long-term maintenance and one-time projects. Legal liabilities are typically comprised of litigation matters that involve potential liability for certain aspects of environmental cleanup and can include third-party claims for property damage or bodily injury allegedly arising from or caused by exposure to hazardous substances originating from our activities or operations or, in certain cases, from the actions or inactions of other persons or companies. Superfund liabilities are typically claims alleging that we are a potentially responsible party ("PRP") and/or are potentially liable for environmental response, removal, remediation and cleanup costs at/or from either a facility we own or a site owned by a third-party. As described in Note 18, "Commitments and Contingencies," to our consolidated financial statements included in Item 8 of this report, Superfund liabilities also include certain liabilities payable to government entities for which we are potentially liable to reimburse the sellers in connection with our 2002 acquisition of substantially all of the assets of the Chemical Services Division (the "CSD assets") of Safety-Kleen Corp. Long-term maintenance liabilities include the costs of groundwater monitoring, treatment system operations, permit fees and facility maintenance for inactive operations. One-time projects liabilities include the costs necessary to comply with regulatory requirements for the removal or treatment of contaminated materials.

Amounts recorded related to the costs required to remediate a location are determined by internal engineers and operational personnel and incorporate input from external third parties. The estimates consider such factors as the nature and extent of environmental contamination (if any); the terms of applicable permits and agreements with regulatory authorities as to cleanup procedures and whether modifications to such permits and agreements will likely need to be negotiated; the cost of performing anticipated cleanup activities based upon current technology; and in the case of Superfund and other sites where other parties will also be responsible for a portion of the cleanup costs, the likely allocation of such costs and the ability of such other parties to pay their share. Each quarter, our management discusses if any events have occurred or milestones have been met that would warrant the creation of a new remedial liability or the revision of an existing remedial liability. Such events or milestones include identification and verification as a PRP, receipt of a unilateral administrative order under Superfund or requirement for RCRA interim corrective measures, completion of the feasibility study under Superfund or the corrective measures study under RCRA, new or modifications to existing permits, changes in property use or a change in the market price of a significant cost item. Remedial liabilities are inherently difficult to estimate and there is a risk that the actual quantities of contaminants could differ from the results of the site investigation, which could materially impact the amount of our liability. It is also possible that chosen methods of remedial solutions will not be successful and funds will be required for alternative solutions.

Remedial liabilities are discounted when the timing of the payments is estimable and the amounts are determinable, with the exception of remedial liabilities assumed as part of an acquisition that are measured at fair value at the acquisition date.

We establish reserves for estimated environmental liabilities based on acceptable technologies when we determine the liability is appropriate. Introductions of new technologies are subject to successful demonstration of the effectiveness of the alternative technology and regulatory approval. We routinely review and evaluate the sites for which we have established estimated environmental liabilities reserves to determine if there should be changes in the established reserves. The changes in estimates are reflected as adjustments in the ordinary course of business in the period when we determine that an adjustment is appropriate as new information becomes available. Upon demonstration of the effectiveness of the alternative technology and applicable regulatory approval, we update our estimated cost of remediating the affected sites.

Goodwill and Other Long-Lived Assets. Goodwill is reviewed for impairment annually as of December 31 or when events or changes in the business environment indicate the carrying value of a reporting unit may exceed its fair value. This review is performed by comparing the fair value of each reporting unit to its carrying value, including goodwill. If the fair value is less than the carrying amount, a loss is recorded for the excess of the carrying value over the fair value up to the carrying amount of goodwill.

We determine our reporting units by identifying the components of each operating segment, and then in some circumstances aggregate components having similar economic characteristics based on quantitative and/or qualitative factors. As of December 31, 2019, we have four reporting units, consisting of Environmental Sales and Service, Environmental Facilities, Safety-Kleen Oil and Safety-Kleen Environmental Services.

We conducted our annual impairment test of goodwill for all of our reporting units to which goodwill was allocated as of December 31, 2019 and determined that no adjustment to the carrying value of goodwill for any reporting unit was then necessary. In all cases the estimated fair value of each reporting unit significantly exceeded its carrying value. We measure fair value for all of our reporting units using an income approach (a discounted cash flow analysis) which incorporates several estimates and assumptions with varying degrees of uncertainty. The discounted cash flow analyses include estimated cash flows for a discrete period and for a terminal period thereafter. We corroborate our estimates of fair values by also considering other factors such as the fair value of comparable companies to businesses contained in our reporting units, as well as performing a reconciliation of the total estimated fair value of all reporting units to our market capitalization.

Indefinite-lived intangible assets are not amortized but are reviewed for impairment annually as of December 31, or when events or changes in the business environment indicate that the carrying value may be impaired. If the fair value of the asset is less than the carrying amount, we perform a quantitative test to determine the fair value. The impairment loss, if any, is measured as the excess of the carrying value of the asset over its fair value. The estimated fair values of the indefinite-lived intangibles exceeded their carrying values at December 31, 2019. However, we will continue to monitor the performance of our indefinite-lived intangible assets, and future events might result in an impairment of indefinite-lived intangible assets.

Our long-lived assets are carried on our financial statements based on their cost less accumulated depreciation or amortization. Long-lived assets with finite lives are reviewed for impairment whenever events or changes in circumstances indicate that their carrying value may not be entirely recoverable. When such factors and circumstances exist, our management compares the projected undiscounted future cash flows associated with the related asset or group of assets to the respective carrying amounts. The impairment loss, if any, would be measured as the excess of the carrying amount over the fair value of the asset and is recorded in the period in which the determination is made. Any resulting impairment losses recorded by us would have an adverse impact on our results of operations.

In consideration of historical goodwill impairments for our Oil and Gas Field Services and Lodging Services operations and continued lower than historical results in the oil and gas related industries, specifically in Western Canada, we continue to monitor the carrying value of those businesses' long-lived assets and assess the risk of asset impairment. We concluded that no events or circumstances have arisen during 2019 which would indicate that the carrying values of those asset groups are not recoverable.

We will continue to evaluate all of our goodwill and other long-lived assets impacted by economic downturns most predominantly in the oil and gas related markets in which we operate. If further economic difficulties resulting from depressed oil and gas related pricing and lower overall activity levels, particularly in our Canadian operations, continue for a significant foreseeable period of time and thus future operating results are significantly less than current expectations, additional impairment charges may be recognized. The market conditions which could lead to such future impairments are currently most prevalent in our Oil and Gas Field Services and Lodging Services operations within the Environmental Sales & Services reporting unit.

Legal Matters. As described in Note 18, "Commitments and Contingencies," to our consolidated financial statements included in Item 8 of this report, we are subject to legal proceedings which relate to our past acquisitions or which have arisen in the ordinary course of business. Accruals are established for legal matters when, in our opinion, it is probable that a liability exists and the liability can be reasonably estimated. As of December 31, 2019, we had reserves of \$26.0 million consisting of (i) \$18.4 million related to pending legal or administrative proceedings, including Superfund liabilities, which were included in remedial liabilities on the consolidated balance sheets and (ii) \$7.6 million primarily related to legal claims as well as federal, state and provincial enforcement actions, which were included in accrued expenses on the consolidated balance sheets. In management's opinion, it is not reasonably possible that the potential liability in excess of what is recorded, if any, that may result from these actions, either individually or collectively, will have a material effect on our financial position, results of operations or cash flows.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

In the normal course of business, we are exposed to market risks, including changes in interest rates and certain foreign currency rates, primarily relating to the Canadian dollar. Our philosophy in managing interest rate risk is to maintain a debt portfolio inclusive of both variable and fixed-rate debt so as to limit our interest expense and exposure to interest rate volatility. In 2018, we entered into interest rate swap agreements with the intention of hedging interest rate exposure on a portion of our outstanding LIBOR-based variable rate senior secured term loans. Under the terms of the swaps, we receive interest based on the 1-month LIBOR index and pay interest at a weighted average rate of approximately 2.92% on an initial notional amount of \$350.0 million. When combined with the 1.75% interest rate margin for Eurocurrency borrowings, the effective annual interest rate on such \$350.0 million aggregate principal amount of term loans is therefore approximately 4.67%.

We designated our interest rate swap agreements as effective cash flow hedges at inception, and therefore the change in fair value is recorded in stockholders' equity as a component of accumulated other comprehensive loss and included in interest expense at the same time as interest expense is affected by the hedged transactions. Differences paid or received over the life of the agreements are recorded as additions to or reductions of interest expense on the underlying debt.

The following table provides information regarding our fixed and variable rate borrowings at December 31, 2019 (in thousands):

Scheduled Maturity Dates	2020	2021	2022	2023	2024	Thereafter	Total
Senior secured term loans due 2024	\$ 7,535	\$ 7,535	\$ 7,535	\$ 7,535	\$ 704,557	\$ —	\$ 734,697
Unsecured senior notes due 2027	—	—	—	—	—	545,000	545,000
Unsecured senior notes due 2029	—	—	—	—	—	300,000	300,000
Long term obligations, at par	\$ 7,535	\$ 7,535	\$ 7,535	\$ 7,535	\$ 704,557	\$ 845,000	\$ 1,579,697

The interest rate on the \$545.0 million senior unsecured notes due July 15, 2027 is fixed at 4.875%. Interest payments on this debt are due semiannually on January 15 and July 15 in the amount of \$13.2 million upon each date commencing January 15, 2020. The interest rate on the \$300.0 million senior unsecured notes due July 15, 2029 is fixed at 5.125%. Interest payments on these \$300.0 million notes are also due semiannually on January 15 and July 15 in the amount of \$7.6 million upon each date commencing on January 15, 2020.

We continue to have interest rate risk relative to the portion of our term loans which exceeds the \$350.0 million of principal which is subject to our interest rate swap agreement. As of December 31, 2019, \$384.7 million of those term loans was subject to variable interest rate risk. The effective interest rate on the variable portion of the term loans as of December 31, 2019 was 3.55%. Should the average interest rate on the variable rate portion of our long-term obligations change by 100 basis points, we estimate that our annual interest expense would change by up to approximately \$3.8 million.

In addition to the fixed and variable rate borrowings described in the above table, we have a revolving credit agreement with maximum borrowings of up to \$400.0 million (with a \$325.0 million sub-limit for letters of credit), under which no borrowings were outstanding at December 31, 2019.

We view our investment in our foreign subsidiaries as long-term; thus, we have not entered into any hedging transactions between any two foreign currencies or between any of the foreign currencies and the U.S. Dollar. Given our significant investment in Canada and the fluctuations that have and can occur between the U.S. Dollar and Canadian Dollar exchange rates, significant movements in cumulative translation adjustment amounts recorded as a component of other comprehensive income (loss) can occur in any given period.

During 2019, our Canadian subsidiaries transacted a portion of their business in U.S. Dollars and at any period end had cash on deposit in U.S. Dollars and outstanding U.S. Dollar accounts receivable related to those transactions. Those cash and receivable amounts are vulnerable to foreign currency transaction gains or losses. Exchange rate movements also affect the translation of Canadian generated profits and losses into U.S. Dollars. Had the Canadian Dollar been 10.0% stronger or weaker against the U.S. Dollar, we would have reported increased or decreased net income of \$5.3 million and \$4.8 million for the years ended December 31, 2019 and 2018, respectively.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Clean Harbors, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Clean Harbors, Inc. and subsidiaries (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive income, cash flows and stockholders' equity, for each of the three years in the period ended December 31, 2019, and the related notes and the schedule listed in the Index at Item 15 (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 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.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 26, 2020, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

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

Remedial Liabilities - Refer to Note 2, Significant Accounting Policies, and Note 11, Remedial Liabilities, to the financial statements

Critical Audit Matter Description

Remedial liabilities include the costs of removal or containment of contaminated material, the treatment of potentially contaminated groundwater and maintenance and monitoring costs necessary to comply with regulatory requirements. Most of the Company's remedial liabilities relate to the active and inactive hazardous waste treatment and disposal facilities which the Company acquired and Superfund sites owned by third parties for which the Company, or the prior owners of certain of the Company's facilities, may have certain indemnification obligations. The Company's estimate of remedial liabilities involved an analysis of such factors as: (i) the nature and extent of environmental contamination (if any); (ii) the terms of applicable permits and agreements with regulatory authorities as to cleanup procedures and whether modifications to such permits and agreements will likely need to be negotiated; (iii) the cost of performing anticipated cleanup activities based upon current technology; and (iv) in the case of Superfund and other sites where other parties will also be responsible for a portion of the cleanup costs, the likely allocation of such costs and the ability of such other parties to satisfy the costs which have been apportioned to these other parties.

Remedial liabilities are inherently difficult to estimate and involve a significant amount of judgment. Estimating remedial liabilities requires that the existing environmental contamination be understood. There are risks that the actual quantities of contaminants differ from the results of the site investigation, and that contaminants exist that have not been identified by the site investigation. In addition, the amount of remedial liabilities recorded is dependent on the remedial method selected. There is a risk that funds will be expended on a remedial solution that is not successful, which could result in the Company incurring incremental costs of an alternative solution.

The Company routinely reviews and evaluates the sites for which remedial liabilities have been recognized to determine if there should be changes in the cost estimates. As a result, the valuation of liabilities is subject to material changes as additional information becomes available, particularly as it relates to changes in technologies and changes in laws and regulations that govern the remediation efforts.

Total remedial liabilities recorded as of December 31, 2019 were \$114.2 million.

Given the subjectivity and judgment involved in measuring remedial liabilities due to the (i) uncertainty as to the types and quantities of contaminants to be remediated, (ii) the stage of remediation and extended period over which the remediation efforts are expected to occur, (iii) complexities and uncertainties of the selection of the method of remediation and inherent variability in the efficacy of the selected remediation efforts, and (iv) understanding the effects on the estimates due to changes in technology and changes in laws and regulations, auditing remedial liabilities involved especially subjective judgment and an increased extent of effort, including the need to involve our specialists who have expertise in environmental remediation.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the remedial liabilities included the following, among others:

- We tested the effectiveness of controls related to the recognition and measurement of remedial liabilities, including those controls over changes in estimates.
- We evaluated management's ability to accurately forecast future cash flows by comparing actual results to management's historical forecasts through retrospective reviews.
- We evaluated the methods and assumptions used by management to estimate the remedial liabilities by confirming specific facts and circumstances related to a selection of sites with project managers and other Company personnel responsible for monitoring these sites, including internal and external counsel.
- With the assistance of auditor specialists who have expertise in environmental matters and specialized skills and training, we evaluated the reasonableness of the Company's estimates by:
 - Searching for information in the public domain for completeness of sites identified for remediation.
 - Assessing the completeness of the Company's costs estimate for a selection of sites, specifically, comparing the costs estimates to relevant regulatory guidelines and specifications.
 - Testing the accuracy of the amounts recorded for a selection of sites, specifically, verifying the mathematical accuracy of the calculation, agreeing cost components to supporting documents, and/or developing an independent range of cost estimates.

/s/ Deloitte & Touche LLP

Boston, Massachusetts
February 26, 2020

We have served as the Company's auditor since 2005.

CLEAN HARBORS, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(dollars in thousands)

	As of December 31,	
	2019	2018
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 371,991	\$ 226,507
Short-term marketable securities	42,421	52,856
Accounts receivable, net of allowances aggregating \$38,711 and \$44,315, respectively	644,738	606,952
Unbilled accounts receivable	56,326	54,794
Deferred costs	21,746	18,770
Inventories and supplies	214,744	199,479
Prepaid expenses and other current assets	48,942	42,800
Total current assets	1,400,908	1,202,158
Property, plant and equipment, net	1,588,151	1,561,978
Other assets:		
Operating lease right-of-use assets	162,206	—
Goodwill	525,013	514,189
Permits and other intangibles, net	419,066	441,875
Other	13,560	18,121
Total other assets	1,119,845	974,185
Total assets	\$ 4,108,904	\$ 3,738,321
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of long-term obligations	\$ 7,535	\$ 7,535
Accounts payable	298,375	276,461
Deferred revenue	73,370	61,843
Accrued expenses	276,540	233,405
Current portion of closure, post-closure and remedial liabilities	23,301	23,034
Current portion of operating lease liabilities	40,979	—
Total current liabilities	720,100	602,278
Other liabilities:		
Closure and post-closure liabilities, less current portion of \$7,283 and \$9,592, respectively	68,368	60,339
Remedial liabilities, less current portion of \$16,018 and \$13,442, respectively	98,155	107,575
Long-term obligations, less current portion	1,554,116	1,565,021
Operating lease liabilities, less current portion	121,020	—
Deferred taxes, unrecognized tax benefits and other long-term liabilities	277,332	233,352
Total other liabilities	2,118,991	1,966,287
Commitments and contingent liabilities (See Note 18)		
Stockholders' equity:		
Common stock, \$0.01 par value:		
Authorized 80,000,000 shares; issued and outstanding 55,797,734 and 55,847,261 shares, respectively	558	558
Additional paid-in capital	644,412	655,415
Accumulated other comprehensive loss	(210,051)	(223,371)
Accumulated earnings	834,894	737,154
Total stockholders' equity	1,269,813	1,169,756
Total liabilities and stockholders' equity	\$ 4,108,904	\$ 3,738,321

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

CLEAN HARBORS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands except per share amounts)

	For the years ended December 31,		
	2019	2018	2017
Revenues:			
Service revenues	\$ 2,842,881	\$ 2,709,239	\$ 2,398,650
Product revenues	569,309	591,064	546,328
Total revenues	3,412,190	3,300,303	2,944,978
Cost of revenues: (exclusive of items shown separately below)			
Service revenues	1,945,021	1,861,975	1,641,798
Product revenues	442,798	443,576	420,875
Total cost of revenues	2,387,819	2,305,551	2,062,673
Selling, general and administrative expenses	484,054	503,747	456,648
Accretion of environmental liabilities	10,136	9,806	9,460
Depreciation and amortization	300,725	298,625	288,422
Income from operations	229,456	182,574	127,775
Other income (expense), net	2,897	(4,510)	(6,119)
Loss on early extinguishment of debt	(6,131)	(2,488)	(7,891)
Gain on sale of businesses	687	—	30,732
Interest expense, net of interest income of \$4,227, \$2,958 and \$1,897, respectively	(78,670)	(81,094)	(85,808)
Income before provision (benefit) for income taxes	148,239	94,482	58,689
Provision (benefit) for income taxes	50,499	28,846	(42,050)
Net income	\$ 97,740	\$ 65,636	\$ 100,739
Earnings per share:			
Basic	\$ 1.75	\$ 1.17	\$ 1.77
Diluted	\$ 1.74	\$ 1.16	\$ 1.76
Shares used to compute earnings per share — Basic	55,845	56,148	57,072
Shares used to compute earnings per share — Diluted	56,129	56,340	57,200

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

CLEAN HARBORS, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(in thousands)

	For the years ended December 31,		
	2019	2018	2017
Net income	\$ 97,740	\$ 65,636	\$ 100,739
Other comprehensive income (loss), net of tax:			
Unrealized (losses) gains on available-for-sale securities	(120)	77	32
Reclassification adjustment for losses on available-for-sale securities included in net income	332	—	143
Unrealized loss on interest rate hedge	(14,401)	(9,579)	—
Reclassification adjustment for losses on interest rate hedge included in net income	2,335	806	—
Foreign currency translation adjustments	25,130	(42,350)	41,636
Unfunded pension liability	44	82	108
Other comprehensive income (loss), net of tax	13,320	(50,964)	41,919
Comprehensive income	\$ 111,060	\$ 14,672	\$ 142,658

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

CLEAN HARBORS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	For the years ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net income	\$ 97,740	\$ 65,636	\$ 100,739
Adjustments to reconcile net income to net cash from operating activities:			
Depreciation and amortization	300,725	298,625	288,422
Allowance for doubtful accounts	2,408	15,817	7,901
Amortization of deferred financing costs and debt discount	3,809	3,846	3,482
Accretion of environmental liabilities	10,136	9,806	9,460
Changes in environmental liability estimates	(332)	2,147	(195)
Deferred income taxes	8,005	19,089	(83,335)
Other (income) expense, net	(2,897)	4,510	6,119
Stock-based compensation	17,816	16,792	13,146
Gain on sale of businesses	(687)	—	(30,732)
Loss on early extinguishment of debt	6,131	2,488	7,891
Environmental expenditures	(18,701)	(10,115)	(12,965)
Changes in assets and liabilities, net of acquisitions:			
Accounts receivable and unbilled accounts receivable	(33,271)	(79,563)	(33,764)
Inventories and supplies	(15,869)	(26,958)	(5,002)
Other current assets	(14,421)	(7,946)	16,720
Accounts payable	7,153	46,915	(10,684)
Other current and long-term liabilities	45,447	12,121	8,495
Net cash from operating activities	413,192	373,210	285,698
Cash flows used in investing activities:			
Additions to property, plant and equipment	(216,324)	(193,344)	(167,007)
Proceeds from sale and disposal of fixed assets	11,655	15,445	7,124
Acquisitions, net of cash acquired	(29,363)	(151,023)	(49,227)
Additions to intangible assets including costs to obtain or renew permits	(3,904)	(4,688)	(1,617)
Purchases of available-for-sale securities	(35,836)	(44,772)	(38,342)
Proceeds from sale of available-for-sale securities	51,202	28,723	376
Proceeds from sale of businesses, net of transactional costs	4,714	—	45,426
Net cash used in investing activities	(217,856)	(349,659)	(203,267)
Cash flows used in financing activities:			
Change in uncashed checks	(3,705)	132	(5,940)
Proceeds from exercise of stock options	—	—	46
Tax payments related to withholdings on vested restricted stock	(7,429)	(3,266)	(3,149)
Repurchases of common stock	(21,390)	(45,080)	(48,971)
Deferred financing costs paid	(10,079)	(4,027)	(5,718)
Payments on finance leases	(586)	—	—
Premiums paid on early extinguishment of debt	(2,701)	(1,238)	(6,028)
Principal payments on debt	(852,535)	(405,768)	(402,000)
Proceeds from issuance of debt, net of discount	845,000	348,250	399,000
Borrowing from revolving credit facility	—	50,000	—
Payment on revolving credit facility	—	(50,000)	—
Net cash used in financing activities	(53,425)	(110,997)	(72,760)
Effect of exchange rate change on cash	3,573	(5,446)	2,731
Increase (decrease) in cash and cash equivalents	145,484	(92,892)	12,402
Cash and cash equivalents, beginning of year	226,507	319,399	306,997
Cash and cash equivalents, end of year	\$ 371,991	\$ 226,507	\$ 319,399
Supplemental information:			
Cash payments for interest and income taxes:			
Interest paid	\$ 60,852	\$ 89,171	\$ 93,174
Income taxes paid	27,035	20,036	18,682
Non-cash investing activities:			
Property, plant and equipment accrued	30,964	15,657	16,109
Transfer of inventory to property, plant and equipment	—	—	12,641
Payable for estimated purchase price adjustment	—	4,032	—

CLEAN HARBORS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)

	Common Stock		Shares Held Under Employee Participation Plan	Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Earnings	Total Stockholders' Equity
	Number of Shares	\$0.01 Par Value					
Balance at January 1, 2017	57,298	\$ 573	\$ (469)	\$ 725,670	\$ (214,326)	\$ 572,793	\$ 1,084,241
Net income	—	—	—	—	—	100,739	100,739
Cumulative effect of change in accounting for stock based compensation	—	—	—	681	—	(450)	231
Other comprehensive income	—	—	—	—	41,919	—	41,919
Stock-based compensation	—	—	—	13,146	—	—	13,146
Issuance of common stock for restricted share vesting, net of employee tax withholding	133	1	—	(3,150)	—	—	(3,149)
Exercise of stock options	2	—	—	46	—	—	46
Repurchases of common stock	(907)	(9)	—	(48,962)	—	—	(48,971)
Shares held under employee participation plan	(25)	—	469	(469)	—	—	—
Balance at December 31, 2017	56,501	565	—	686,962	(172,407)	673,082	1,188,202
Net income	—	—	—	—	—	65,636	65,636
Cumulative effect of change in accounting principle	—	—	—	—	—	(1,564)	(1,564)
Other comprehensive loss	—	—	—	—	(50,964)	—	(50,964)
Stock-based compensation	—	—	—	16,792	—	—	16,792
Issuance of common stock for restricted share vesting, net of employee tax withholding	160	1	—	(3,267)	—	—	(3,266)
Repurchases of common stock	(814)	(8)	—	(45,072)	—	—	(45,080)
Balance at December 31, 2018	55,847	558	—	655,415	(223,371)	737,154	1,169,756
Net income	—	—	—	—	—	97,740	97,740
Other comprehensive income	—	—	—	—	13,320	—	13,320
Stock-based compensation	—	—	—	17,816	—	—	17,816
Issuance of common stock for restricted share vesting, net of employee tax withholding	249	3	—	(7,432)	—	—	(7,429)
Repurchases of common stock	(298)	(3)	—	(21,387)	—	—	(21,390)
Balance at December 31, 2019	55,798	\$ 558	\$ —	\$ 644,412	\$ (210,051)	\$ 834,894	\$ 1,269,813

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

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(1) OPERATIONS

Clean Harbors, Inc., through its subsidiaries (collectively, the "Company"), is a leading provider of environmental, energy and industrial services throughout North America. The Company is also the largest re-refiner and recycler of used oil and the largest provider of parts cleaning and related environmental services to commercial, industrial and automotive customers in North America.

(2) SIGNIFICANT ACCOUNTING POLICIES

The accompanying consolidated financial statements of the Company reflect the application of certain significant accounting policies as described below:

Principles of Consolidation

The accompanying consolidated statements include the accounts of Clean Harbors, Inc. and its majority-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions, which are evaluated on an ongoing basis, that affect the amounts reported in the Company's consolidated financial statements and accompanying notes. Management bases its estimates on historical experience and on various other assumptions it believes to be reasonable at the time under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities and disclosure, if any, of contingent assets and liabilities and reported amounts of revenues and expenses. Actual results could differ from those estimates and judgments.

Cash, Cash Equivalents and Uncashed Checks

Cash consists primarily of cash on deposit and money market accounts. Marketable securities with maturities of three months or less from the date of purchase are classified as cash equivalents. The Company's cash management program with its revolving credit lender allows for the maintenance of a zero balance in the U.S. bank disbursement accounts that are used to issue vendor and payroll checks. The program can result in checks outstanding in excess of bank balances in the disbursement accounts. When checks are presented to the bank for payment, cash deposits in amounts sufficient to fund the checks are made, at the Company's discretion, either from funds provided by other accounts or under the terms of the Company's revolving credit facility. Therefore, until checks are presented for payment, there is no right of offset by the bank and the Company continues to have control over cash relating to both released as well as unreleased checks. Checks that have been written to vendors or employees but have not yet been presented for payment at the Company's bank are classified as uncashed checks as part of accounts payable and changes in the balance are reported as a financing activity in the consolidated statements of cash flows.

Marketable Securities

The Company, through its wholly-owned captive insurance subsidiary, invests in marketable securities consisting of U.S. Treasury securities, corporate notes and bonds and commercial paper. As of December 31, 2019 and 2018, the Company had total marketable securities and cash equivalents as follows (in thousands):

	December 31, 2019	December 31, 2018
Commercial paper	\$ 2,395	\$ 8,126
Total cash equivalents	<u>2,395</u>	<u>8,126</u>
U.S. Treasury securities	12,406	10,133
Corporate notes and bonds	26,678	38,036
Commercial paper	3,337	4,687
Total short-term marketable securities	<u>42,421</u>	<u>52,856</u>
Total financial assets	<u>\$ 44,816</u>	<u>\$ 60,982</u>

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Realized gains and losses on sales of available-for-sale marketable securities in the years ended December 31, 2019, 2018 and 2017 were immaterial. The majority of the marketable securities have a remaining maturity of less than one year and fair value approximates cost.

Allowances for Doubtful Accounts

On a regular basis, the Company evaluates its accounts receivable and establishes the allowance for doubtful accounts based on an evaluation of certain criteria and evidence of collection certainty including historical collection trends, current economic trends and changes in customer payment patterns. Past-due receivable balances are written off when the Company's internal collection efforts have been deemed unsuccessful in collecting the outstanding balance due.

Credit Concentration

Concentration of credit risks in accounts receivable is limited due to the large number of customers comprising the Company's customer base throughout North America. The Company maintains policies over credit extension that include credit evaluations, credit limits and collection monitoring procedures on a customer-by-customer basis. However, the Company generally does not require collateral before services are performed. No individual customer accounted for more than 10% of accounts receivable or more than 10% of total direct revenues in the periods presented.

Inventories and Supplies

Inventories are stated at the lower of cost or market. The cost of oil and oil products is principally determined on a first-in, first-out ("FIFO") basis. The cost of supplies and drums, solvent and solution and other inventories is determined on a FIFO or a weighted average cost basis. The Company continually reviews its inventories for obsolete or unsalable items and adjusts its carrying value to reflect estimated realizable values.

Property, Plant and Equipment, net (excluding landfill assets)

Property, plant and equipment, net is stated at cost less accumulated depreciation. Expenditures for major renewals and improvements which extend the life or usefulness of the asset are capitalized. Items of an ordinary repair or maintenance nature are charged directly to operating expense as incurred. Gains and losses on the sale of property, plant and equipment are included in other income (expense), net. During the construction and development period of an asset, the costs incurred are classified as construction-in-progress.

The Company depreciates and amortizes the capitalized cost of these assets, using the straight-line method as follows:

Asset Classification	Estimated Useful Life
Buildings and building improvements	
Buildings	20-42 years
Leasehold and building improvements	2-45 years
Camp and lodging equipment	8-15 years
Vehicles	2-15 years
Equipment	
Capitalized software and computer equipment	3-5 years
Containers and railcars	8-16 years
All other equipment	4-30 years
Furniture and fixtures	5-8 years

The Company recognizes an impairment in the carrying value of long-lived assets when the expected future undiscounted cash flows derived from the assets, or group of assets, are less than their carrying value. The Company did not record any impairment charges related to long-lived assets in any of the periods presented.

Goodwill

Goodwill is comprised of the purchase price of business acquisitions in excess of the fair value of the net assets acquired. Goodwill is reviewed for impairment annually as of December 31, or when events or circumstances indicate that the carrying value of the reporting unit may exceed its fair value. If the carrying value of a reporting unit exceeds the fair value, an

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

impairment loss will be recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit. The Company did not recognize any impairment losses in any of the periods presented. See Note 8, "Goodwill and Other Intangible Assets," for additional information related to the Company's goodwill impairment tests.

Permits and Other Intangibles

Costs related to acquiring licenses, permits and intangible assets, such as legal fees, site surveys, engineering costs and other expenditures are capitalized. Other intangible assets consist primarily of customer and supplier relationships, trademarks and trade names and non-compete agreements.

Permits relating to landfills are amortized on a units-of-consumption basis. All other permits are amortized over periods ranging from 5 to 30 years on a straight-line basis. Finite-lived intangible assets are amortized on a straight-line basis over their respective useful lives, which range from 5 to 20 years.

All finite-lived intangible assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying value may not be recoverable. When such factors and circumstances exist, management compares the projected undiscounted future cash flows associated with the related asset or group of assets to the carrying amount. The impairment loss, if any, is measured as the excess of the carrying amount over the fair value of the asset or group of assets.

Indefinite-lived intangible assets are not amortized but are reviewed for impairment annually as of December 31, or when events or changes in the business environment indicate that the carrying value may be impaired. If the fair value of the asset is less than the carrying amount, the impairment loss is measured as the excess of the carrying value of the asset over its fair value.

Landfill Accounting

The Company amortizes landfill improvements and certain landfill-related permits over the estimated useful lives. The units-of-consumption method is used to amortize land, landfill cell construction, asset retirement costs and remaining landfill cells and sites. The Company also utilizes the units-of-consumption method to record closure and post-closure obligations for landfill cells and sites. Under the units-of-consumption method, the Company includes future estimated construction and asset retirement costs, as well as costs incurred to date, in the amortization base of the landfill assets. Additionally, where appropriate, as described below, the Company includes probable expansion airspace that has yet to be permitted in the calculation of the total remaining useful life of the landfill. If it is determined that expansion capacity should no longer be considered in calculating the recoverability of a landfill asset, the Company may be required to recognize an asset impairment or incur significantly higher amortization expense. If at any time the Company makes the decision to abandon the expansion effort, the capitalized costs related to the expansion effort are expensed immediately.

Landfill assets—Landfill assets include the costs of landfill site acquisition, permits and cell construction incurred to date. These amounts are recorded at cost, which includes capitalized interest as applicable. Landfill assets, net of amortization, are combined with management's estimate of the costs required to complete construction of the landfill to determine the amount to be amortized over the remaining estimated useful economic life of a site. Amortization of landfill assets is recorded on a units-of-consumption basis, such that the landfill assets should be completely amortized at the date the landfill ceases accepting waste. Amortization totaled \$12.3 million, \$10.3 million and \$9.5 million for the years ended December 31, 2019, 2018 and 2017, respectively. Changes in estimated costs to complete construction are applied prospectively to the amortization rate.

Landfill capacity—Landfill capacity, which is the basis for the amortization of landfill assets and for the accrual of final closure and post-closure obligations, represents total permitted airspace plus unpermitted airspace that management believes is probable of ultimately being permitted based on established criteria. The Company applies the following criteria for evaluating the probability of obtaining a permit for future expansion airspace at existing sites, which provides management a basis to evaluate the likelihood of success of unpermitted expansions:

- Personnel are actively working to obtain the permit or permit modifications (land use, state and federal) necessary for expansion of an existing landfill, and progress is being made on the project.
- Management expects to submit the application within the next year and to receive all necessary approvals to accept waste within the next five years.
- At the time the expansion is included in management's estimate of the landfill's useful economic life, it is probable that the required approvals will be received within the normal application and processing time periods for approvals in the jurisdiction in which the landfill is located.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

- We have a legal right to use or obtain the right to use the land associated with the expansion plan through title or lease.
- There are no significant known political, technical, legal or business restrictions or other issues that could impair the success of such expansion.
- Management is committed to pursuing the expansion which is supported by a complete financial feasibility analysis which demonstrates that the expansion will have a positive financial and operational impact.
- Additional airspace and related additional costs, including permitting, final closure and post-closure costs have been estimated based on the conceptual design of the proposed expansion.

As of December 31, 2019, there were no unpermitted expansions included in the Company's landfill accounting model. If actual expansion airspace is significantly different from management's estimate of expansion airspace, the amortization rates used for the units-of-consumption method would change, therefore impacting our profitability. If we determine that there is less actual expansion airspace at a landfill, this would increase amortization expense recorded and decrease profitability, while if we determine a landfill has more actual expansion airspace, amortization expense would decrease and profitability would increase.

As of December 31, 2019, the Company had 11 active landfill sites (including the Company's two non-commercial landfills), which have estimated remaining lives (based on anticipated waste volumes and remaining highly probable airspace) as follows:

Facility Name	Location	Remaining Lives (Years)	Remaining Highly Probable Airspace (cubic yards) (in thousands)		
			Permitted	Unpermitted	Total
Altair	Texas	2	179	—	179
Buttonwillow	California	23	5,982	—	5,982
Deer Park	Texas	3	103	—	103
Deer Trail	Colorado	28	1,697	—	1,697
Grassy Mountain	Utah	43	4,909	—	4,909
Kimball	Nebraska	7	165	—	165
Lambton	Ontario, Canada	60	4,710	—	4,710
Lone Mountain	Oklahoma	23	3,905	—	3,905
Ryley	Alberta	5	653	—	653
Sawyer	North Dakota	69	3,459	—	3,459
Westmorland	California	64	2,732	—	2,732
			28,494	—	28,494

At December 31, 2019 and 2018, the Company had no cubic yards of permitted, but not highly probable, airspace.

The following table presents the remaining highly probable airspace from January 1, 2017 through December 31, 2019 (in thousands of cubic yards):

	2019	2018	2017
Remaining capacity at January 1,	29,760	31,113	32,228
Changes in highly probable airspace, net	—	(223)	—
Consumed	(1,266)	(1,130)	(1,115)
Remaining capacity at December 31,	28,494	29,760	31,113

Amortization of cell construction costs and accrual of cell closure obligations—Landfills are typically comprised of a number of cells, which are constructed within a defined acreage (or footprint). The cells are typically discrete units, which require both separate construction and separate capping and closure procedures. Cell construction costs are the costs required to excavate and construct the landfill cell. These costs are typically amortized on a units-of-consumption basis, such that they are completely amortized when the specific cell ceases accepting waste. In some instances, the Company has landfills that are engineered and constructed as "progressive trenches." In progressive trench landfills, a number of contiguous cells form a progressive trench. In those instances, the Company amortizes cell construction costs over the airspace within the entire trench, such that the cell construction costs will be fully amortized at the end of the trench useful life.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The design and construction of a landfill does not create a landfill asset retirement obligation. Rather, the asset retirement obligation for cell closure (the cost associated with capping each cell) is incurred in relatively small increments as waste is placed in the landfill. Therefore, the cost required to construct the cell cap is capitalized as an asset retirement cost and a liability of an equal amount is established, based on the discounted cash flow associated with each capping event, as airspace is consumed. Spending for cell capping is reflected as environmental expenditures within operating activities in the consolidated statements of cash flows.

Landfill final closure and post-closure liabilities—The balance of landfill final closure and post-closure liabilities at December 31, 2019 and 2018 was \$39.4 million and \$37.8 million, respectively. The Company has material financial commitments for the costs associated with requirements of the Environmental Protection Agency ("EPA") and the comparable regulatory agency in Canada for landfill final closure and post-closure activities. In the United States, the landfill final closure and post-closure requirements are established under the standards of the EPA, and are implemented and applied on a state-by-state basis. The Company develops estimates for the cost of these activities based on an evaluation of site-specific facts and circumstances, including the Company's interpretation of current regulatory requirements and proposed regulatory changes. Such estimates may change in the future due to various circumstances including, but not limited to, permit modifications, changes in legislation or regulations, technological changes and results of environmental studies.

Final closure costs are the costs incurred after the site ceases to accept waste, but before the landfill is certified as closed by the applicable state regulatory agency. These costs generally include the costs required to cap the final cell of the landfill (if not included in cell closure), the costs required to dismantle certain structures for landfills and other landfill improvements, and regulation-mandated groundwater monitoring and leachate management. Post-closure costs involve the maintenance and monitoring of a landfill site that has been certified closed by the applicable regulatory agency. These costs generally include groundwater monitoring and leachate management. Regulatory post-closure periods are generally 30 years after landfill closure. Final closure and post-closure obligations are accrued on a units-of-consumption basis, such that the present value of the final closure and post-closure obligations are fully accrued at the date the landfill discontinues accepting waste.

Cell closure, final closure and post-closure costs (also referred to as "asset retirement obligations") are calculated by estimating the total obligation in current dollars, adjusted for inflation (1.02% during both 2019 and 2018) and discounted at the Company's credit-adjusted risk-free interest rate (6.02% and 5.66% during 2019 and 2018, respectively).

Non-Landfill Closure and Post-Closure Liabilities

The balance of non-landfill closure and post-closure liabilities at December 31, 2019 and 2018 was \$36.3 million and \$32.1 million, respectively. Non-landfill closure and post-closure obligations arise when the Company commences non-landfill facility operations and include costs required to dismantle and decontaminate certain structures and other costs incurred during the closure process. Post-closure costs, if required, include associated maintenance and monitoring costs as required by the closure permit. Post-closure periods are performance-based and are not generally specified in terms of years in the closure permit, but generally range from 10 to 30 years or more.

The Company records its non-landfill closure and post-closure liability by: (i) estimating the current cost of closing a non-landfill facility and the post-closure care of that facility, if required, based upon the closure plan that the Company is required to follow under its operating permit, or in the event the facility operates with a permit that does not contain a closure plan, based upon legally enforceable closure commitments made by the Company to various government agencies; (ii) estimates as to when future operations may cease; (iii) inflating the current cost estimates of closing the non-landfill facility using the inflation rate to the time of closing; and (iv) discounting the future value back to the present using the credit-adjusted risk-free interest rate.

The estimates for non-landfill closure and post-closure liabilities are inherently uncertain due to the possibility that permit and regulatory requirements will change in the future, impacting the estimation of total costs and the timing of the expenditures. Management reviews non-landfill closure and post-closure liabilities for changes to key assumptions that would impact the amount of the recorded liabilities. Changes that would prompt management to revise a liability estimate include changes in legal requirements that impact the Company's expected closure plan or scope of work, in the market price of a significant cost item, in the estimate as to when future operations at a location might cease or in the expected timing of the costs. Changes in estimates for non-landfill closure and post-closure events immediately impact the liability and the value of the corresponding asset. If a change is made to a fully-amortized asset, the adjustment is charged immediately to expense. When a change in estimate relates to an asset that has not been fully amortized, the adjustment to the asset recognized in income prospectively as a component of amortization. Historically, changes to non-landfill closure and post-closure estimates have not been material.

CLEAN HARBORS, INC. AND SUBSIDIARIES**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)***Remedial Liabilities*

The balance of remedial liabilities at December 31, 2019 and 2018 was \$114.2 million and \$121.0 million, respectively. Remedial liabilities, including Superfund liabilities, include the costs of removal or containment of contaminated material, treatment of potentially contaminated groundwater and maintenance and monitoring costs necessary to comply with regulatory requirements. Most of the Company's remedial liabilities relate to the active and inactive hazardous waste treatment and disposal facilities which the Company acquired in the last 17 years and Superfund sites owned by third parties for which the Company, or the prior owners of certain of the Company's facilities for which the Company may have certain indemnification obligations, have been identified as potentially responsible parties ("PRPs") or potential PRPs. The Company's estimate of remedial liabilities involves an analysis of such factors as: (i) the nature and extent of environmental contamination (if any); (ii) the terms of applicable permits and agreements with regulatory authorities as to cleanup procedures and whether modifications to such permits and agreements will likely need to be negotiated; (iii) the cost of performing anticipated cleanup activities based upon current technology; and (iv) in the case of Superfund and other sites where other parties will also be responsible for a portion of the cleanup costs, the likely allocation of such costs and the ability of such other parties to pay their share. The measurement of remedial liabilities is reviewed at least quarterly and changes in estimates are recognized in the consolidated statements of operations when identified.

The Company periodically evaluates potential remedial liabilities at sites that it owns or operates or to which the Company or the sellers of the Chemical Services Division of Safety-Kleen ("CSD") assets (or the respective predecessors of the Company or such sellers) transported or disposed of waste, including 130 Superfund sites as of December 31, 2019. The Company periodically reviews and evaluates sites requiring remediation, including Superfund sites, giving consideration to the nature (i.e., owner, operator, arranger, transporter or generator) and the extent (i.e., amount and nature of waste hauled to the location, number of years of site operations or other relevant factors) of the Company's (or such sellers') alleged connection with the site, the extent (if any) to which the Company believes it may have an obligation to indemnify cleanup costs in connection with the site, the regulatory context surrounding the site, the accuracy and strength of evidence connecting the Company (or such sellers) to the location, the number, connection and financial ability of other named and unnamed PRPs and the nature and estimated cost of the likely remedy. Where the Company concludes that it is probable that a liability has been incurred and an amount can be estimated, a provision is made, based upon management's judgment and prior experience of such estimated liability.

Remedial liabilities are inherently difficult to estimate. Estimating remedial liabilities requires that the existing environmental contamination be understood. There are risks that the actual quantities of contaminants differ from the results of the site investigation, and that contaminants exist that have not been identified by the site investigation. In addition, the amount of remedial liabilities recorded is dependent on the remedial method selected. There is a risk that funds will be expended on a remedial solution that is not successful, which could result in the Company incurring the additional incremental costs of an alternative solution. Such estimates, which are subject to change, are subsequently revised if and when additional or new information becomes available.

Remedial liabilities are discounted when the timing of the payments is determinable and the amounts are estimable. In the case of remedial liabilities assumed in connection with acquisitions, acquired liabilities are recorded at fair value as of the dates of the acquisitions calculated by inflating costs in current dollars using an estimate of future inflation rates as of the respective acquisition dates until the expected time of payment, and then discounting the amount of the payments to their present value using a risk-free discount rate as of the acquisition dates. Discount rates used in the present value determination of the Company's remedial liabilities range from 1.37% to 4.90%.

Self-Insurance Liabilities

The Company self-insures a significant portion of expected losses under its workers' compensation, employee medical, comprehensive general liability and vehicle liability. Liabilities associated with these losses are recorded based on the Company's estimates of the ultimate cost to settle incurred claims, both reported and not yet reported. These recorded liabilities are estimated based on independent actuarial estimates and judgments which consider the frequency and settlement amount of historical claims data.

Revenue Recognition

The Company generates service and product revenues through the following operating segments: Environmental Services and Safety-Kleen. The Company recognizes revenue when control of the promised goods or services is transferred to the Company's customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods or services.

CLEAN HARBORS, INC. AND SUBSIDIARIES**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

The majority of the Company's revenues are for services, which are recognized based on time and materials incurred at contractually agreed-upon rates. Product revenues are recognized when the products are delivered and control transfers to the customer. The Company's payment terms vary by the type and location of its customers and the products or services offered. The periods between invoicing and when payments are due are not significant. For all periods presented, any amounts billed to customers related to shipping and handling are classified as revenue and the Company's shipping and handling costs are included in costs of revenues. In the course of operations, the Company collects sales tax and other excise taxes from its customers and recognizes a current liability which is then relieved when the taxes are remitted to the appropriate government authorities. The Company excludes sales and other excise taxes that it collects from customers from its revenues.

The Company's Environmental Services operating segment generally has the following four sources of revenue:

Technical Services—Technical Services revenues are generated from fees charged for waste material management and disposal services including onsite environmental management services, collection and transportation, packaging, recycling, treatment and disposal of waste. Revenue is primarily generated by short-term projects, most of which are governed by master service agreements that are long-term in nature. These master service agreements are typically entered into with the Company's larger customers and outline the pricing and legal frameworks for such arrangements. Services are provided based on purchase orders or agreements with the customer and include prices based upon units of volume of waste, and transportation and other fees. Collection and transportation revenues are recognized over time, as the customer receives and consumes the benefits of the services as they are being performed and the Company has a right to payment for performance completed to date. The Company uses the input method to recognize revenue over time, based on time and materials incurred. Revenues for treatment and disposal of waste are recognized upon completion of treatment, final disposition in a landfill or incineration, or when the waste is shipped to a third party for processing and disposal. The Company periodically enters into bundled arrangements for the collection and transportation and disposal of waste. For such arrangements, transportation and disposal are considered distinct performance obligations and the Company allocates revenue to each based on the relative standalone selling price (i.e. the estimated price that a customer would pay for the services on a standalone basis). Revenues from waste that is not yet completely processed and disposed and the related costs are deferred. The deferred revenues and costs are recognized when the related services are completed. The period between collection and transportation and the final processing and disposal ranges depending on location of the customer, but generally is measured in days.

Field and Emergency Response Services—Field Services revenues are generated from cleanup services at customer sites, including municipalities and utilities, or other locations on a scheduled or emergency response basis. Services include confined space entry for tank cleaning, site decontamination, large remediation projects, demolition, spill cleanup on land and water, railcar cleaning, product recovery and transfer and vacuum services. Additional services include filtration and water treatment services. Response services for environmental emergencies include any scale from man-made disasters such as oil spills, to natural disasters such as hurricanes. These services are provided based on purchase orders or agreements with customers and include prices generally based upon daily, hourly or job rates for equipment, materials and personnel. The Company recognizes revenue for these services over time, as the customer receives and consumes the benefits of the service as they are being performed and the Company has a right to payment for performance completed to date. The Company uses the input method to recognize revenue over time, based on time and materials incurred. The duration of such services can be over a number of hours, several days or even months for larger scale projects.

Industrial Services—Industrial Services revenues are generated from industrial and specialty services provided to refineries, mines, upgraders, chemical plants, pulp and paper mills, manufacturing facilities, power generation facilities and other industrial customers throughout North America. Services include in-plant cleaning and maintenance services, plant outage and turnaround services, decoking and pigging, chemical cleaning, high and ultra-high pressure water cleaning, pipeline inspection and coating services, large tank and surface impoundment cleaning, oilfield transport, daylighting, production services and directional boring services supporting drilling, completion and production programs. Services are provided based on purchase orders or agreements with the customer and include prices based upon daily, hourly or job rates for equipment, materials and personnel. The Company recognizes revenue for these services over time, as the customer receives and consumes the benefits of the services as they are being performed and the Company has a right to payment for performance completed to date. The Company uses the input method to recognize revenue over time, based on time and materials incurred.

Oil, Gas and Lodging Services and Other—Oil, Gas and Lodging Services and Other is primarily comprised of revenues generated from providing Oil and Gas Field Services that support upstream activities such as exploration and drilling for oil and gas companies and Lodging Services to customers in Western Canada and Texas. The Company recognizes Oil and Gas Field Services revenue over time, as the customer receives and consumes the benefits of the services as they are being performed and the Company has a right to payment for performance completed to date. The Company uses the input method to recognize

CLEAN HARBORS, INC. AND SUBSIDIARIES**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

revenue over time, based on time and materials incurred. Revenue for lodging accommodation services is recognized over time based on passage of time.

The Company's Safety-Kleen operating segment generally has the following two sources of revenue:

Safety-Kleen Environmental Services—Safety-Kleen Environmental Services revenues are generated from providing parts washer services, containerized waste handling and disposal services, oil collection services, vacuum services, direct sales of blended oil products, and other complementary services and product sales. Containerized waste services consist of profiling, collecting, transporting and recycling or disposing of a wide variety of waste. Other products and services include sale of complementary supply products including automotive fluids and shop supplies and other environmental services. Parts washer services include customer use of our parts washer equipment, cleaning and maintenance of the parts washer equipment and removal and replacement of used cleaning fluids. Parts washer services are considered a single performance obligation due to the highly integrated and interdependent nature of the arrangement. Revenue from parts washer services is recognized over the service interval as the customer receives the benefit of the services. Collection and transportation revenues are recognized over time, as the customer receives and consumes the benefits of the services as they are being performed and the Company has a right to payment for performance completed to date. The Company uses the input method to recognize revenue over time, based on time and materials incurred. Product revenue is recognized upon the transfer of control whereby control transfers when the products are delivered to the customer.

Safety-Kleen Oil—Revenues from Safety-Kleen Oil, previously referred to as Kleen Performance Products, are generated from sales of high-quality base and blended lubricating oils to third-party distributors, government agencies, fleets, railroads and industrial customers. The business also sells recycled fuel oil to asphalt plants, industrial plants and pulp and paper companies. The used oil is also processed into vacuum gas oil which can be further re-refined into lubricant base oils or sold directly into the marine diesel oil fuel market. Revenue for oil products is recognized at a point in time, upon the transfer of control. Control transfers when the products are delivered to the customer.

The Company adopted Accounting Standards Codification 606, *Revenue from contracts with customers*, on January 1, 2018 without adjusting prior period amounts. The only significant impact from the adoption of this standard related to incremental disclosures now required. Upon adoption, a cumulative effect adjustment was not recorded.

Foreign Currency

The Company has international operations, substantially all of which are located in Canada. The functional currencies of those operations are the local currency and therefore assets and liabilities of those foreign operations are translated to U.S. Dollars at the exchange rate in effect at the balance sheet date and revenue and expenses at the average exchange rate for the period. Gains and losses from the translation of the consolidated financial statements of foreign subsidiaries into U.S. Dollars are included in stockholders' equity as a component of accumulated other comprehensive loss. Gains and losses from transactions not denominated in the functional currency of an entity are recognized in the consolidated statements of operations. Recorded balances that are denominated in a currency other than the functional currency are remeasured to the functional currency using the exchange rate at the balance sheet date and gains or losses are recorded in the consolidated statements of operations.

Advertising Expense

Advertising costs are expensed as incurred. Advertising expense was \$9.8 million in 2019, \$10.5 million in 2018 and \$11.8 million in 2017.

Stock-Based Compensation

Stock-based compensation cost is measured at the grant date based on the fair value of the award and is recognized as expense over the requisite service period, which generally represents the vesting period. In addition, the Company issues awards with performance targets established at the grant date. The expense for these awards is recognized over the requisite service period when management believes it is probable those performance targets will be achieved. The fair value of the Company's grants are based on the closing price of the Company's common stock on the respective dates of grant. Forfeitures are recognized as they occur.

Income Taxes

Current income tax expense approximates cash to be paid or refunded for taxes for the applicable period. Deferred tax expense or benefit is the result of changes between deferred tax assets and liabilities. Deferred tax assets and liabilities are

CLEAN HARBORS, INC. AND SUBSIDIARIES**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

determined based upon the temporary differences between the financial statement basis and tax basis of assets and liabilities as well as from net operating loss and tax credit carryforwards as measured by the enacted tax rates which will be in effect when these differences reverse. The effect of a change in tax rates on deferred tax assets and liabilities is generally recognized in income in the period that includes the enactment date. The Company evaluates the recoverability of future tax deductions and credits and a valuation allowance is established by tax jurisdiction when, based on an evaluation of both positive and negative objective verifiable evidence, it is more likely than not that some portion or all of deferred tax assets will not be realized.

The Company recognizes and measures a tax benefit from uncertain tax positions when it is more likely than not that the tax position will be sustained upon examination by the taxing authorities, based on the technical merits of the position. The Company recognizes a liability for unrecognized tax benefits resulting from uncertain tax positions taken or expected to be taken in a tax return. The Company adjusts these liabilities when its judgment changes as a result of the evaluation of new information not previously available. Due to the complexity of some of these uncertainties, the ultimate resolution may result in a payment that is materially different from the current estimate or future recognition of an unrecognized benefit. These differences will be reflected as increases or decreases to income tax expense in the period in which they are determined.

The Company recognizes interest and penalties related to unrecognized tax benefits within the provision (benefit) for income taxes line in the consolidated statements of operations. Accrued interest and penalties are included within the deferred taxes, unrecognized tax benefits and other long-term liabilities line in the consolidated balance sheet.

Earnings per Share ("EPS")

Basic EPS is calculated by dividing net income by the weighted average number of common shares outstanding during the period. Diluted EPS gives effect to all potentially dilutive common shares that were outstanding during the period.

Leases

The Company's leases predominately relate to real estate and equipment such as vehicles and industrial equipment utilized in operations as well as rail cars utilized in connection with the Company's transportation needs. Contracts are reviewed at inception to determine if the arrangement is a lease and, if so, whether it is an operating or finance lease. For all of its leases, the Company has elected not to separate lease and nonlease components, such as common area maintenance.

The Company generally enters into real estate leases with five to ten-year terms and non-real estate leases with two to seven-year terms. In the normal course of business, the Company also enters into short-term leases having terms of less than one-year. These leases are generally equipment leases entered into for short periods of time (e.g. daily, weekly or monthly) to satisfy immediate and/or short-term operational needs of the business which can arise based upon the nature of particular services performed or seasonality factors. The Company has elected not to recognize right of use ("ROU") assets and lease liabilities for these short-term leases. Expense for all such short-term leases is disclosed as short-term lease cost as shown in Note 19, "Leases."

Operating and finance leases with terms exceeding one year are recognized as ROU assets and lease liabilities and measured based on the present value of the future lease payments over the lease term at commencement date. When applicable, the ROU asset includes any lease payments made at or before the commencement date and initial direct costs incurred and is reduced by lease incentives received under the lease agreement.

Certain of the Company's real estate leases contain escalating future lease payments. Escalating lease payments that are based upon explicit amounts contained in the lease or an index (e.g., consumer price index) are included in its determination of future lease payments to determine the ROU asset and lease liability recognized at the commencement date. Any differences in the future lease payments from initial recognition are not anticipated to be material and will be recorded as variable lease cost in the period incurred. The variable lease cost will also include the Company's portion of property tax, utilities and common area maintenance. A significant portion of the Company's real estate lease agreements include renewal periods at the Company's option. The Company includes these renewal periods in the lease term only when renewal is reasonably certain based upon facts and circumstances specific to the lease and known by the Company. The Company uses its incremental borrowing rate on collateralized debt based on the information available at the lease commencement date in determining the present value of future lease payments as the implicit rate is typically not readily determinable.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Recent Accounting Pronouncements

Standards implemented

In February 2016, the Financial Accounting Standards Board issued Accounting Standards Update 2016-02, *Leases (Topic 842)*. The amendment increases transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. The Company adopted Topic 842 on January 1, 2019 using the modified retrospective method of adoption. Prior period amounts have not been adjusted and continue to be reported in accordance with the Company's historical accounting methodology pursuant to ASC 840, *Leases*. As permitted under the transition guidance, the Company elected to apply the package of three practical expedients for all existing leases which, among other things, allowed the Company to maintain the lease classification for all existing leases at the adoption date. The adoption of Topic 842 resulted in the recognition of ROU assets of \$185.5 million and total current and noncurrent lease liabilities of \$188.5 million at adoption. Additionally, Topic 842 required new and expanded disclosures to enable users of financial statements to assess the amount, timing and uncertainty of cash flows arising from leases. The standard did not have a material impact on the consolidated statements of operations or cash flows.

(3) REVENUES

Disaggregation of Revenue

We disaggregate the Company's third party revenues by geographic location and source of revenue as we believe these categories depict how revenue and cash flows are affected by economic factors (in thousands):

	For the year ended December 31, 2019			
	Environmental Services	Safety-Kleen	Corporate	Total
<u>Primary Geographical Markets</u>				
United States	\$ 1,721,322	\$ 1,220,096	\$ (586)	\$ 2,940,832
Canada	371,041	98,595	1,722	471,358
Total third party revenues	\$ 2,092,363	\$ 1,318,691	\$ 1,136	\$ 3,412,190
<u>Sources of Revenue</u> ⁽¹⁾				
Technical Services	\$ 1,120,043	\$ —	\$ —	\$ 1,120,043
Field and Emergency Response Services	340,906	—	—	340,906
Industrial Services	514,390	—	—	514,390
Oil, Gas and Lodging Services and Other	117,024	—	1,136	118,160
Safety-Kleen Environmental Services	—	851,520	—	851,520
Safety-Kleen Oil ⁽²⁾	—	467,171	—	467,171
Total third party revenues	\$ 2,092,363	\$ 1,318,691	\$ 1,136	\$ 3,412,190

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

	For the year ended December 31, 2018			
	Environmental Services	Safety-Kleen	Corporate	Total
Primary Geographical Markets				
United States	\$ 1,598,402	\$ 1,196,661	\$ 1,082	\$ 2,796,145
Canada	405,441	98,694	23	504,158
Total third party revenues	<u>\$ 2,003,843</u>	<u>\$ 1,295,355</u>	<u>\$ 1,105</u>	<u>\$ 3,300,303</u>
Sources of Revenue ⁽¹⁾				
Technical Services	\$ 1,037,388	\$ —	\$ —	\$ 1,037,388
Field and Emergency Response Services	304,727	—	—	304,727
Industrial Services	541,895	—	—	541,895
Oil, Gas and Lodging Services and Other	119,833	—	1,105	120,938
Safety-Kleen Environmental Services	—	795,077	—	795,077
Safety-Kleen Oil ⁽²⁾	—	500,278	—	500,278
Total third party revenues	<u>\$ 2,003,843</u>	<u>\$ 1,295,355</u>	<u>\$ 1,105</u>	<u>\$ 3,300,303</u>

(1) All revenue except oil and oil product sales within Safety-Kleen Oil and product sales within Safety-Kleen Environmental Services, which include various automotive related fluids, shop supplies and direct blended oil sales, are recognized over time. Safety-Kleen Oil and Safety-Kleen Environmental Services product sales are recognized at a point in time.

(2) Safety-Kleen Oil was formerly known as Kleen Performance Products.

Contract Balances

(in thousands)	December 31, 2019	December 31, 2018
Receivables	\$ 644,738	\$ 606,952
Contract assets (unbilled receivables)	56,326	54,794
Contract liabilities (deferred revenue)	73,370	61,843

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets) and customer advances and deposits or deferred revenue (contract liabilities) on the consolidated balance sheet. Generally, billing occurs subsequent to revenue recognition, as a right to payment is not just subject to passage of time, resulting in contract assets. Contract assets are generally classified as current. The Company sometimes receives advances or deposits from its customers before revenue is recognized, resulting in contract liabilities. These assets and liabilities are reported on the consolidated balance sheet on a contract-by-contract basis at the end of each reporting period. The contract liability balances at the beginning of each period presented were generally fully recognized in the subsequent three-month period.

Variable Consideration

The nature of the Company's contracts give rise to certain types of variable consideration, including in limited cases volume discounts. Accordingly, management establishes a revenue allowance to cover the estimated amounts of revenue that may need to be credited to customers' accounts in future periods. The Company estimates the amount of variable consideration to include in the estimated transaction price based on historical experience, anticipated performance and its best judgment at the time and to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved.

Contract Costs

Contract costs include direct and incremental costs to obtain or fulfill a contract. The Company's contract costs that are subject to capitalization are comprised of costs associated with parts washer services and costs associated with the treatment and disposal of waste. Parts washer costs include costs of solvent, commissions paid relating to revenue generated from parts washer services, and transportation costs associated with transferring the product picked up from the services as it is returned to the Company's facilities or a third party site. Costs related to the treatment of waste include costs for waste receiving, drum movement and storage, waste consolidation and transportation between facilities. Deferred costs associated with parts washer

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

services are amortized ratably over the average service interval, which ranges between four and 16 weeks. Deferred costs related to treatment and disposal of waste are recognized when the corresponding waste is disposed of and are included in deferred costs within total current assets in the Company's consolidated balance sheets. The deferred contract cost balances at the beginning of each period presented were fully recognized in cost of revenue in the subsequent three-month period.

(4) BUSINESS COMBINATIONS**2019 Acquisitions**

On May 31, 2019, the Company acquired a privately-owned business for \$14.8 million in cash consideration. The acquired company expands the environmental services and hazardous materials management services of the Company and is included in the Environmental Services segment. In connection with this acquisition, a preliminary goodwill amount of \$7.4 million was recognized.

On March 1, 2019, the Company acquired certain assets of a privately-owned business for \$10.4 million. The acquired business complements the Safety-Kleen segment's core service offerings, such as used motor oil collection, parts washers, oil filter recycling and vacuum services. In connection with this acquisition, a preliminary goodwill amount of \$5.2 million was recognized.

The results of operations of these acquired businesses were not material in 2019. Pro forma revenue and earnings amounts on a combined basis as if these acquisitions had been completed on January 1, 2018 are immaterial to the consolidated financial statements of the Company since that date.

2018 Acquisitions

On August 31, 2018, the Company acquired a privately-owned company which expands the environmental services and waste oil capabilities of the Company for a \$26.7 million purchase price, net of cash. The acquired company is included in the Safety-Kleen and Environmental Services segments. In connection with this acquisition, a goodwill amount of \$12.3 million was recognized. The results of operations of this acquired business were not material in 2018.

On February 23, 2018, the Company completed the acquisition of the U.S. Industrial Cleaning Business of Veolia Environmental Services North America LLC (the "Veolia Business"). The acquisition provides significant scale and industrial services capabilities while increasing the size of the Company's existing U.S. Industrial Services business. The Company acquired the Veolia Business for a purchase price of \$124.5 million. The Veolia Business has been integrated into the Environmental Services segment. The amount of revenue from the Veolia Business included in the Company's results of operations for the year ended December 31, 2018 was \$154.0 million. The amount of pre-tax loss from the Veolia Business included in the Company's results of operations for the year ended December 31, 2018 was \$0.9 million, which included \$14.6 million in depreciation expense as well as \$0.6 million of amortization expense related to intangible assets. During the year ended December 31, 2018, the Company incurred acquisition-related costs of approximately \$1.4 million in connection with the transaction which are included in selling, general and administrative expenses in the consolidated statements of operations.

The Company finalized purchase accounting for the Veolia Business in the first quarter of 2019. The components and allocation of the purchase price for the Veolia Business consist of the following amounts (in thousands):

	Final Allocation
Accounts receivable, including unbilled receivable	\$ 39,558
Inventories and supplies	1,126
Prepaid expenses and other current assets	828
Property, plant and equipment	72,243
Permits and other intangibles	5,140
Current liabilities	(18,372)
Closure and post-closure liabilities	(354)
Total identifiable net assets	100,169
Goodwill	24,331
Total purchase price	<u>\$ 124,500</u>

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The weighted average amortization period for the intangibles acquired is 8.2 years. The excess of the total purchase price, which includes the aggregate cash consideration paid in excess of the fair value of the tangible net assets and intangible assets acquired, was recorded as goodwill. The goodwill recognized is attributable to the expected operating synergies and growth potential that the Company expects to realize from this acquisition. Goodwill generated from the acquisition is deductible for tax purposes.

Pro forma revenue and earnings amounts on a combined basis as if this acquisition had been completed on January 1, 2017 are immaterial to the consolidated financial statements of the Company since that date.

2017 Acquisitions

On July 14, 2017, the Company acquired Lonestar West Inc. ("Lonestar"), a public company headquartered in Alberta, Canada, for CAD \$41.8 million, (\$33.1 million USD at acquisition date), net of cash acquired, which included an equity payout of CAD \$0.72 per share to Lonestar shareholders and the assumption of approximately CAD \$21.3 million (\$16.8 million USD at acquisition date) in outstanding debt, which Clean Harbors subsequently repaid. The acquisition supports the Company's growth in the daylighting and hydro excavation services markets. In addition to increasing the size of the Company's hydro vacuum fleet, Lonestar's network of locations provides the Company with direct access to key geographic markets in both the United States and Canada. The acquired company is included in the Environmental Services segment. In connection with this acquisition a goodwill amount of \$2.8 million was recognized.

On January 31, 2017, the Company acquired a privately held company for a purchase price of approximately \$11.9 million in cash, net of cash acquired. The acquired business produces and distributes oil products and therefore complements the Company's closed loop model as it relates to the sale of its oil products. The acquired company is included in the Safety-Kleen segment. In connection with this acquisition a goodwill amount of \$5.0 million was recognized.

The combined amount of direct revenues from the acquisitions included in the Company's results of operations for the year ended December 31, 2017 was approximately \$14.5 million.

(5) DISPOSITION OF BUSINESS

On June 30, 2017, the Company completed the sale of its Transformer Services business, a non-core business within the Environmental Services operating segment. The Transformer Services business was sold for \$45.5 million (\$43.4 million net of \$2.1 million in transactional related costs). As a result of the sale, the Company recognized a pre-tax gain of \$30.7 million in gain on sale of businesses in the Company's consolidated statement of operations for the year ended December 31, 2017.

(6) INVENTORIES AND SUPPLIES

Inventories and supplies consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Oil and oil related products	\$ 75,408	\$ 70,823
Supplies and drums	115,128	104,609
Solvent and solutions	9,973	10,657
Other	14,235	13,390
Total inventories and supplies	<u>\$ 214,744</u>	<u>\$ 199,479</u>

Supplies and drums consist primarily of drums and containers used in providing the Company's products and services as well as critical spare parts to support the Company's incinerator and re-refinery operations. Other inventories consisted primarily of parts washer components, cleaning fluids, absorbents and automotive fluids, such as windshield washer fluid and antifreeze.

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(7) PROPERTY, PLANT AND EQUIPMENT

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

	December 31, 2019	December 31, 2018
Land	\$ 131,023	\$ 123,734
Asset retirement costs (non-landfill)	15,924	15,148
Landfill assets	182,276	154,918
Buildings and improvements ⁽¹⁾	499,159	440,188
Camp and lodging equipment	158,277	152,998
Vehicles ⁽¹⁾	785,056	721,735
Equipment	1,779,366	1,697,490
Furniture and fixtures	6,054	5,453
Construction in progress	36,679	20,931
	3,593,814	3,332,595
Less - accumulated depreciation and amortization	2,005,663	1,770,617
Total property, plant and equipment, net	\$ 1,588,151	\$ 1,561,978

(1) December 31, 2019 balances inclusive of ROU assets classified as finance leases.

Depreciation expense, inclusive of landfill and finance lease amortization was \$265.5 million, \$264.3 million and \$251.4 million for the years ended December 31, 2019, 2018 and 2017, respectively.

(8) GOODWILL AND OTHER INTANGIBLE ASSETS

The changes in goodwill for the years ended December 31, 2019 and 2018 were as follows (in thousands):

	Environmental Services	Safety-Kleen	Totals
Balance at January 1, 2018	\$ 172,386	\$ 306,137	\$ 478,523
Increase from current period acquisitions	37,007	3,697	40,704
Measurement period adjustments from prior period acquisitions	(78)	—	(78)
Decrease from disposition of business	—	—	—
Foreign currency translation	(2,296)	(2,664)	(4,960)
Balance at December 31, 2018	\$ 207,019	\$ 307,170	\$ 514,189
Increase from current period acquisitions	7,378	5,225	12,603
Measurement period adjustments from prior period acquisitions	(2,675)	(1,355)	(4,030)
Foreign currency translation	809	1,442	2,251
Balance at December 31, 2019	\$ 212,531	\$ 312,482	\$ 525,013

The Company conducted its annual impairment test of goodwill as of December 31, 2019 and determined that no adjustment to the carrying value of goodwill for any reporting unit was then necessary because the fair values of the reporting units exceeded their respective carrying values. The fair value of all reporting units was determined using an income approach based upon estimates of future discounted cash flows. The resulting estimates of fair value were validated through the consideration of other factors such as the fair value of comparable companies to the reporting units and a reconciliation of the sum of all estimated fair values of the reporting units to the Company's overall market capitalization. In all cases, the estimated fair values of the reporting units significantly exceeded the respective carrying values.

Significant judgments and unobservable inputs categorized as Level 3 in the fair value hierarchy are inherent in the impairment tests performed and include assumptions about the amount and timing of expected future cash flows, growth rates, and the determination of appropriate discount rates. Level 3 inputs are unobservable inputs for the asset or liability in which there is little, if any, market activity for the asset or liability at the measurement date. The Company believes that the

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

assumptions used in its impairment tests are reasonable, but variations in any of the assumptions may result in different measurements of fair values.

The impacts of any adverse business and market conditions which impact the overall performance of the Company's reporting units will continue to be monitored. If the Company's reporting units do not achieve the financial performance that the Company expects, it is possible that goodwill impairment charges may result. There can therefore be no assurance that future events will not result in an impairment of goodwill.

As of December 31, 2019 and 2018, the Company's finite-lived and indefinite-lived intangible assets consisted of the following (in thousands):

	December 31, 2019			December 31, 2018		
	Cost	Accumulated Amortization	Net	Cost	Accumulated Amortization	Net
Permits	\$ 184,235	\$ 87,228	\$ 97,007	\$ 177,583	\$ 79,358	\$ 98,225
Customer and supplier relationships	401,696	207,884	193,812	393,487	179,824	213,663
Other intangible assets	38,331	33,018	5,313	37,262	29,743	7,519
Total amortizable permits and other intangible assets	624,262	328,130	296,132	608,332	288,925	319,407
Trademarks and trade names	122,934	—	122,934	122,468	—	122,468
Total permits and other intangible assets	\$ 747,196	\$ 328,130	\$ 419,066	\$ 730,800	\$ 288,925	\$ 441,875

The Company regularly monitors and assesses whether events or changes in circumstances relative to the Company's business might indicate that future cash flows attributable to the Company's asset groups may not be sufficient to recover the current value of those assets. During the year ended and as of December 31, 2019, there were no events or changes in circumstances which would indicate that the carrying values of the Company's asset groups would not be recoverable and thus no impairment charge was recorded related to the Company's long-lived assets. If expectations of future cash flows were to decrease in the future as a result of worse than expected or prolonged periods of depressed activity, future impairments may become evident.

Amortization expense of permits and other intangible assets for the years ended December 31, 2019, 2018 and 2017 were \$35.2 million, \$34.4 million and \$37.0 million, respectively.

The expected amortization of the net carrying amount of finite-lived intangible assets at December 31, 2019 is as follows (in thousands):

<u>Years ending December 31,</u>	<u>Expected Amortization</u>
2020	\$ 33,083
2021	29,788
2022	29,534
2023	25,306
2024	23,921
Thereafter	154,500
	<u>\$ 296,132</u>

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(9) ACCRUED EXPENSES

Accrued expenses consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Accrued insurance	\$ 74,376	\$ 70,217
Accrued interest	21,222	3,930
Accrued compensation and benefits	72,473	77,881
Accrued income, real estate, sales and other taxes	35,749	25,670
Accrued other	72,720	55,707
	<u>\$ 276,540</u>	<u>\$ 233,405</u>

As of December 31, 2019 and 2018, accrued insurance included employee medical insurance costs of \$14.3 million and \$14.7 million, respectively, and accruals for losses under our workers' compensation, comprehensive general liability and vehicle liability self-insurance programs of \$59.4 million and \$53.9 million, respectively.

The increase in accrued interest from the comparable period in 2018 is due to the timing of required interest payments which changed due to the redemption of the 2021 unsecured senior notes and the issuance of the 2027 and 2029 unsecured senior notes. For additional information relating to accrued interest, see Note 12, "Financing Arrangements."

The increase in accrued income, real estate, sales and other taxes from the comparable period in 2018 is due to an increase in accrued federal tax of \$10.5 million driven by higher taxable income and the timing of tax payments.

As of December 31, 2019 and 2018, accrued other includes a derivative liability of \$20.8 million and \$8.8 million, respectively, related to the Company's cash flow hedges. The increase in the fair value of the derivative liability is mainly due to changes in variable interest rates. For additional information relating to the derivative liability, see Note 12, "Financing Arrangements."

(10) CLOSURE AND POST-CLOSURE LIABILITIES

The changes to closure and post-closure liabilities (also referred to as "asset retirement obligations") from January 1, 2018 through December 31, 2019 were as follows (in thousands):

	Landfill Retirement Liability	Non-Landfill Retirement Liability	Total
Balance at January 1, 2018	\$ 32,382	\$ 28,655	\$ 61,037
Liabilities assumed in acquisitions	—	685	685
New asset retirement obligations	2,518	—	2,518
Accretion	2,537	2,567	5,104
Changes in estimates recorded to consolidated statement of operations	(37)	1,497	1,460
Changes in estimates recorded to consolidated balance sheet	1,867	64	1,931
Expenditures	(1,224)	(1,057)	(2,281)
Currency translation and other	(234)	(289)	(523)
Balance at December 31, 2018	<u>37,809</u>	<u>32,122</u>	<u>69,931</u>
Liabilities assumed in acquisitions	—	220	220
New asset retirement obligations	2,705	—	2,705
Accretion	2,772	2,829	5,601
Changes in estimates recorded to consolidated statement of operations	248	2,437	2,685
Changes in estimates recorded to consolidated balance sheet	3,303	562	3,865
Expenditures	(7,718)	(2,121)	(9,839)
Currency translation and other	282	201	483
Balance at December 31, 2019	<u>\$ 39,401</u>	<u>\$ 36,250</u>	<u>\$ 75,651</u>

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

All of the landfill facilities reflected in the above table were active as of December 31, 2019 and 2018. The 2019 and 2018 environmental changes in estimates recorded to the consolidated statements of operations include \$2.3 million and \$1.2 million, respectively, related to increased facility closure costs at one of our locations.

Anticipated payments (based on current estimated costs and anticipated timing of necessary regulatory approvals to commence work on closure and post-closure activities) for each of the next five years and thereafter are as follows (in thousands):

Year ending December 31.

2020	\$	7,571
2021		10,307
2022		14,407
2023		11,329
2024		3,344
Thereafter		277,001
Undiscounted closure and post-closure liabilities		323,959
Less: Discount at credit-adjusted risk-free rate		(158,186)
Less: Undiscounted estimated closure and post-closure liabilities relating to airspace not yet consumed		(90,122)
Present value of closure and post-closure liabilities	\$	75,651

(11) REMEDIAL LIABILITIES

The changes to remedial liabilities from January 1, 2018 through December 31, 2019 were as follows (in thousands):

	Remedial Liabilities for Landfill Sites	Remedial Liabilities for Inactive Sites	Remedial Liabilities (Including Superfund) for Non-Landfill Operations	Total
Balance at January 1, 2018	\$ 1,800	\$ 65,342	\$ 57,326	\$ 124,468
Accretion	86	2,745	1,871	4,702
Changes in estimates recorded to consolidated statement of operations	(1)	130	558	687
Expenditures	(47)	(3,759)	(4,028)	(7,834)
Currency translation and other	—	857	(1,863)	(1,006)
Balance at December 31, 2018	1,838	65,315	53,864	121,017
Accretion	88	2,639	1,808	4,535
Changes in estimates recorded to consolidated statement of operations	(17)	(913)	(2,087)	(3,017)
Expenditures	(59)	(5,079)	(3,724)	(8,862)
Currency translation and other	1	29	470	500
Balance at December 31, 2019	\$ 1,851	\$ 61,991	\$ 50,331	\$ 114,173

In 2019, the net reduction in the company's remedial liabilities from changes in estimates recorded to the consolidated statement of operations was \$3.0 million and primarily related to reductions in estimates for remedial activities at five locations. There were no significant (benefits) charges in 2018 resulting from changes in estimates for remedial liabilities.

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Anticipated payments at December 31, 2019 (based on current estimated costs and anticipated timing of necessary regulatory approvals to commence work on remedial activities) for each of the next five years and thereafter were as follows (in thousands):

<u>Year ending December 31,</u>		
2020	\$	16,729
2021		17,883
2022		9,207
2023		7,930
2024		5,701
Thereafter		77,000
Undiscounted remedial liabilities		134,450
Less: Discount		(20,277)
Total remedial liabilities	\$	114,173

The following tables show, respectively, (i) the amounts of such estimated liabilities associated with the types of facilities and sites involved and (ii) the amounts of such estimated liabilities associated with each facility or site which represents at least 5% of the total and with all other facilities and sites as a group and as of December 31, 2019.

Estimates based on type of facility or site (in thousands, except percentages):

Type of Facility or Site	Remedial Liability	% of Total	Reasonably Possible Additional Liabilities ⁽¹⁾
Facilities now used in active conduct of the Company's business (39 facilities)	\$ 44,381	38.9%	\$ 10,691
Inactive facilities not now used in active conduct of the Company's business but most of which were acquired because the assumption of remedial liabilities for such facilities was part of the purchase price for the CSD assets (37 facilities)	61,991	54.3	10,658
Superfund sites owned by third parties (17 sites)	7,801	6.8	780
Total	\$ 114,173	100.0%	\$ 22,129

(1) Amounts represent the high end of the range of management's best estimate of the reasonably possible additional liabilities.

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Estimates based on amount of potential liability (in thousands, except percentages):

Location	Type of Facility or Site	Remedial Liability ⁽¹⁾	% of Total	Reasonably Possible Additional Liabilities ⁽²⁾
Baton Rouge, LA	Closed incinerator and landfill	\$ 22,690	19.9%	\$ 3,975
Bridgeport, NJ	Closed incinerator	18,191	15.9	2,578
Mercier, Quebec	Idled incinerator and legal proceedings	10,761	9.4	1,098
Linden, NJ	Operating solvent recycling center	7,312	6.4	762
Various	All other incinerators, landfills, wastewater treatment facilities and service centers (72 facilities)	47,418	41.6	12,936
Various	Superfund sites (each representing less than 5% of total liabilities) owned by third parties (17 sites)	7,801	6.8	780
Total		\$ 114,173	100.0%	\$ 22,129

- (1) \$18.4 million of the \$114.2 million remedial liabilities include estimates related to the legal and administrative proceedings discussed in Note 18, "Commitments and Contingencies," as well as other such estimated remedial liabilities.
- (2) Amounts represent the high end of the range of management's best estimate of the reasonably possible additional liabilities.

Revisions to remediation reserve requirements may result in upward or downward adjustments to income from operations in any given period. The Company believes that its extensive experience in the environmental services business, as well as its involvement with a large number of sites, provides a reasonable basis for estimating its aggregate liability. It is possible, however, that future changes in available technology, regulatory or enforcement developments, the results of environmental studies or other factors could necessitate the recording of additional liabilities or the revision of currently recorded liabilities that could be material. Since the Company's satisfaction of the liabilities will occur over many years, the Company cannot reasonably predict the nature or extent of possible future events or the impact that those events, if any, might have on the current estimates of remedial liabilities.

(12) FINANCING ARRANGEMENTS

The following table is a summary of the Company's financing arrangements (in thousands):

Current Obligations:	December 31, 2019	December 31, 2018
Senior secured Term Loan Agreement ("Term Loan Agreement")	\$ 7,535	\$ 7,535
Long-Term Obligations:		
Senior secured Term Loan Agreement due June 30, 2024	\$ 727,162	\$ 734,697
Unsecured senior notes, at 4.875%, due July 15, 2027 ("2027 Notes")	545,000	—
Unsecured senior notes, at 5.125%, due July 15, 2029 ("2029 Notes")	300,000	—
Unsecured senior notes, at 5.125%, due June 1, 2021 ("2021 Notes")	—	845,000
Long-term obligations, at par	1,572,162	1,579,697
Unamortized debt issuance costs and premium, net	(18,046)	(14,676)
Long-term obligations, at carrying value	\$ 1,554,116	\$ 1,565,021

Financing Activities

Unsecured Senior Notes. On July 2, 2019, the Company completed a private placement of \$545.0 million aggregate principal amount of 2027 Notes and \$300.0 million aggregate principal amount of 2029 Notes (collectively, the "New Notes"). The 2027 Notes will mature on July 15, 2027, and the 2029 Notes will mature on July 15, 2029. Interest payments on each series of the New Notes will be paid semiannually on January 15 and July 15, commencing on January 15, 2020.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The Company may redeem all or any portion of the 2027 Notes prior to July 15, 2022 or the 2029 Notes prior to July 15, 2024 at a redemption price equal to 100% of the principal amount redeemed plus a make whole premium as of the date of redemption including accrued and unpaid interest, if any, up to the date of redemption. Additionally, prior to July 15, 2022 for the 2027 Notes and July 15, 2024 for the 2029 Notes, the Company may use cash proceeds of one or more equity offerings to redeem up to 35% in aggregate principal of the 2027 Notes or the 2029 Notes at a redemption price equal to 104.875% or 105.125%, respectively, plus accrued and unpaid interest thereon, if any, up to the date of redemption.

After the dates in the preceding paragraph, the Company may redeem all or any portion of the New Notes which remain outstanding at any time upon proper notice at the following redemption prices if redeemed during the twelve-month period commencing on July 15 of the years set forth below plus accrued and unpaid interest, if any, up to the date of redemption:

2027 Notes

Year	Percentage
2022	102.438%
2023	101.219%
2024 and thereafter	100.000%

2029 Notes

Year	Percentage
2024	102.563%
2025	101.281%
2026 and thereafter	100.000%

Concurrently with the closing of the New Notes on July 2, 2019, the Company repurchased, using a portion of the net proceeds from the sale of the New Notes, an aggregate principal amount of \$701.0 million of the 2021 Notes. The total amount paid in repurchasing the 2021 Notes was \$706.2 million including \$3.1 million of accrued interest. On July 17, 2019, the Company redeemed the remaining \$144.0 million outstanding 2021 Notes, including \$0.9 million of accrued interest, using the remaining net proceeds from the sale of the New Notes and available cash. In connection with this early repurchase and redemption of the 2021 Notes, the Company recorded a loss on early extinguishment of debt of \$6.1 million during the year ended December 31, 2019. With the repurchase and redemption of the 2021 Notes, none of the Company's outstanding debt is registered under the Securities Act of 1933, as amended.

The New Notes and the related indenture contain various customary non-financial covenants and are guaranteed by substantially all of the Company's current and future domestic subsidiaries. The New Notes are effectively subordinated to the Company's Term Loan Agreement, revolving credit facility and finance lease obligations to the extent of the value of the assets securing such secured indebtedness. The New Notes are effectively subordinated to all indebtedness and other liabilities of the Company's subsidiaries that are not guarantors of the New Notes.

Senior Secured Term Loans. On April 17, 2018, the Company, and substantially all of the Company's domestic subsidiaries as guarantors, entered into the first amendment (the "First Amendment") of the Term Loan Agreement. The First Amendment reduced the applicable interest rate margin for the Company's term loans (the "Term Loans") outstanding under the Term Loan Agreement by 25 basis points for both Eurocurrency borrowings and base rate borrowings. After giving effect to the repricing, the applicable interest rate margins for the Term Loans are 1.75% for Eurocurrency borrowings and 0.75% for base rate borrowings.

On July 19, 2018, the Company, and substantially all of the Company's domestic subsidiaries as guarantors, entered into an Incremental Facility Amendment (the "Incremental Facility Amendment") to the Company's Term Loan Agreement. The Incremental Facility Amendment increased the principal amount of the Term Loans outstanding under the Term Loan Agreement by \$350.0 million. The Term Loans under the Term Loan Agreement will mature on June 30, 2024 and may be prepaid at any time without premium or penalty other than customary breakage costs with respect to Eurodollar based loans. The Company's obligations under the Term Loan Agreement are guaranteed by all of the Company's domestic restricted subsidiaries and secured by liens on substantially all of the assets of the Company and the guarantors. The effective annual interest rate of the Term Loans on December 31, 2019 was 3.55%.

Concurrently with the closing on July 19, 2018 of the Incremental Facility Amendment, the Company repurchased \$322.0 million aggregate principal of previously outstanding unsecured senior notes. The total amount paid to repurchases these notes

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

was \$330.9 million inclusive of \$7.9 million of accrued interest and \$1.0 million of debt redemption fees. On August 1, 2018, the Company redeemed the remaining \$78.0 million of principal of the previously outstanding notes. In connection with this redemption, the Company recorded a loss on early extinguishment of debt of \$2.5 million during the year ended December 31, 2018.

As of December 31, 2019 and December 31, 2018, the estimated fair value of the Company's outstanding long-term obligations, including the current portion, was \$1.6 billion. The Company's estimates of the fair value of its long-term obligations, including the current portion, are based on quoted market prices or other available market data which are considered Level 2 measures according to the fair value hierarchy. Level 2 utilizes quoted market prices in markets that are not active, broker or dealer quotation, or alternative pricing sources with reasonable levels of price transparency for similar assets and liabilities.

Revolving Credit Facility. On November 1, 2016, the Company and one of the Company's subsidiaries (the "Canadian Borrower") entered into an amended and restated credit agreement for the Company's revolving credit facility with Bank of America, N.A. ("BofA"), as agent for the lenders under the facility (the "Agent"). Under the amended and restated facility, the Company has the right to obtain revolving loans and letters of credit for a combined maximum of up to \$300.0 million (with a sub-limit of \$250.0 million for letters of credit) and the Canadian Borrower has the right to obtain revolving loans and letters of credit for a combined maximum of up to \$100.0 million (with a \$75.0 million sub-limit for letters of credit). Availability under the U.S. line is subject to a borrowing base basically comprised of 85% of the eligible accounts receivable of the Company and its U.S. subsidiaries plus 100% of cash deposited in a controlled account with the Agent, and availability under the Canadian line is subject to a borrowing base basically comprised of 85% of the eligible accounts receivable of the Company's Canadian subsidiaries plus 100% of cash deposited in a controlled account with the Agent's Canadian affiliate. Subject to certain conditions, the facility will expire on November 1, 2021.

Borrowings under the revolving credit facility bear interest at a rate of, at the Company's option, either (i) LIBOR plus an applicable margin ranging from 1.25% to 1.50% per annum based primarily on the level of the Company's average liquidity for the most recent 30 day period or (ii) BofA's base rate plus an applicable margin ranging from 0.25% to 0.50% per annum based primarily on such average liquidity. There is also an unused line fee, calculated on the then unused portion of the lenders' \$400.0 million maximum commitments, ranging from 0.25% to 0.30% per annum of the unused commitment. For outstanding letters of credit, the Company will pay to the lenders a fee equal to the then applicable LIBOR margin described above, and to the issuing banks a standard fronting fee and customary fees and charges in connection with all amendments, extensions, draws and other actions with respect to letters of credit.

The Company's obligations under the revolving credit facility (including revolving loans and reimbursement obligations for outstanding letters of credit) are guaranteed by substantially all of the Company's U.S. subsidiaries and secured by a first lien on the Company's and its U.S. subsidiaries' accounts receivable. The Canadian Borrower's obligations under the facility are guaranteed by substantially all of the Company's Canadian subsidiaries and secured by a first lien on the accounts receivable of the Canadian subsidiaries.

The Company utilizes letters of credit primarily as security for financial assurance which it has been required to provide to regulatory bodies for its hazardous waste facilities and which would be called only in the event that the Company fails to satisfy closure, post-closure and other obligations under the permits issued by those regulatory bodies for such licensed facilities. On August 1, 2018, the Company borrowed \$50.0 million under the revolving credit facility in connection with the redemption of \$78.0 million of previously outstanding unsecured senior notes. The Company repaid the \$50.0 million borrowing during the fourth quarter of 2018. At December 31, 2019 and 2018, the revolving credit facility had no outstanding loan balances, availability of \$229.2 million and \$235.4 million, respectively, and outstanding letters of credit of \$146.9 million and \$130.1 million, respectively.

Cash Flow Hedges

The Company's strategy to hedge against fluctuations in variable interest rates involves entering into interest rate derivative agreements.

Although the interest rate on the Term Loans is variable, the Company has effectively fixed the interest rate on \$350.0 million principal outstanding by entering into interest rate swap agreements in 2018 with a notional amount of \$350.0 million. Under the terms of the interest rate swap agreements, the Company receives interest based on the 1-month LIBOR index and pays interest at a weighted average rate of approximately 2.92%, resulting in an effective annual interest rate of approximately 4.67%.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The Company recognizes derivative instruments as either assets or liabilities on the consolidated balance sheet at fair value. No ineffectiveness has been identified on these swaps and, therefore, the change in fair value is recorded in stockholders' equity as a component of accumulated other comprehensive loss. Amounts are reclassified from accumulated other comprehensive loss into interest expense on the consolidated statement of operations in the same period or periods during which the hedged transaction affects earnings.

As of December 31, 2019 and December 31, 2018, the Company recorded a derivative liability with a fair value of \$20.8 million and \$8.8 million, respectively, within accrued expenses in connection with these cash flow hedges.

The fair value of the interest rate swaps is calculated using discounted cash flow valuation methodologies based upon the one-month LIBOR yield curves that are observable at commonly quoted intervals for the full term of the interest rate swaps and as such is considered a Level 2 measure according to the fair value hierarchy.

(13) INCOME TAXES

The domestic and foreign components of income before provision (benefit) for income taxes were as follows (in thousands):

	For the years ended December 31,		
	2019	2018	2017
Domestic	\$ 156,571	\$ 115,070	\$ 101,714
Foreign	(8,332)	(20,588)	(43,025)
Total	\$ 148,239	\$ 94,482	\$ 58,689

The provision (benefit) for income taxes consisted of the following (in thousands):

	For the years ended December 31,		
	2019	2018	2017
Current:			
Federal	\$ 20,482	\$ (7,677)	\$ 25,613
State	14,564	12,653	11,083
Foreign	7,448	4,781	4,589
	<u>42,494</u>	<u>9,757</u>	<u>41,285</u>
Deferred			
Federal	7,933	19,899	(85,488)
State	550	(1,205)	1,085
Foreign	(478)	395	1,068
	<u>8,005</u>	<u>19,089</u>	<u>(83,335)</u>
Provision (benefit) for income taxes	\$ 50,499	\$ 28,846	\$ (42,050)

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The Company's effective tax rate for fiscal years 2019, 2018 and 2017 was 34.1%, 30.5% and (71.6)%, respectively. The effective income tax rate varied from the amount computed using the statutory federal income tax rate as follows (in thousands):

	For the years ended December 31,		
	2019	2018	2017
Tax expense at US statutory rate	\$ 31,130	\$ 19,841	\$ 20,541
State income taxes, net of federal benefit	10,597	8,711	4,547
Foreign rate differential	276	(1,124)	3,733
Valuation allowance	4,459	10,466	16,552
Uncertain tax position interest and penalties	474	(1,806)	3,730
Tax credits	(50)	(9,799)	—
Non-deductible compensation	1,922	1,813	256
Other	1,691	1,032	1,600
Adjustment for Tax Cuts and Jobs Act	—	(288)	(93,009)
Provision (benefit) for income taxes	\$ 50,499	\$ 28,846	\$ (42,050)

Due to the Tax Cuts and Jobs Act (the "Tax Act") signed into law on December 22, 2017, the statutory rate in effect was 21% in 2019 and 2018, compared to 35% in 2017.

For the year ended December 31, 2017, the Company calculated its best estimate of the impact of the Tax Act in its year-end income tax provision in accordance with its understanding of the Tax Act and guidance available as of the date of the 2017 Form 10-K filing and as a result recorded a net benefit of \$93.0 million as a component of the 2017 income tax expense. This provisional net income tax benefit was comprised of a \$100.5 million tax benefit for the remeasurement of deferred tax assets and liabilities to the 21% rate at which they are expected to reverse, offset by a one-time tax expense on deemed repatriation of \$7.5 million. This one-time charge was after the utilization of \$7.5 million of foreign tax credits which had full valuation allowances applied to them previously.

During 2018, the Company completed its analysis of impacts of the Tax Act and specific to the one-time deemed repatriation, adjusted the previous amount recorded of \$7.5 million to \$6.6 million resulting in a \$0.9 million benefit to tax expense recorded in 2018. The Company also recorded the final remeasurement of its deferred tax assets and liabilities and adjusted the deferred tax benefit from \$100.5 million to \$99.9 million or approximately \$0.6 million of deferred expense recorded in 2018. The total net impact of changes in tax law resulted in a net benefit of approximately \$0.3 million in 2018.

During 2018, the Company also completed an analysis of certain federal manufacturing and research and development credit benefits for tax years 2014 through 2017. Upon the filing of its 2017 tax return in October 2018, the Company recognized \$3.3 million of tax benefits and recognized an additional \$7.1 million upon the amendments of its 2014 through 2016 tax returns for a net benefit recorded as a component of the 2018 tax provision of \$9.8 million (shown as Tax credits in the table above).

During the year ended December 31, 2018, the Company recorded \$5.0 million of tax benefits related to tax deductible foreign currency losses to accumulated other comprehensive loss and as such these benefits are not included within the provision (benefit) for income taxes.

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The components of the total net deferred tax assets and liabilities as of December 31, 2019 and 2018 were as follows (in thousands):

	2019	2018
Deferred tax assets:		
Provision for doubtful accounts	\$ 8,949	\$ 10,715
Closure, post-closure and remedial liabilities	26,960	28,380
Operating lease liabilities	40,879	—
Accrued expenses	17,602	15,686
Accrued compensation	7,155	7,774
Net operating loss carryforwards ⁽¹⁾	50,824	43,284
Tax credit carryforwards ⁽²⁾	16,909	16,909
Uncertain tax positions accrued interest and federal benefit	4,176	519
Stock-based compensation	2,435	3,440
Other	10,418	7,067
Total deferred tax assets	186,307	133,774
Deferred tax liabilities:		
Property, plant and equipment	(184,594)	(164,246)
Operating lease right-of-use assets	(40,985)	—
Permits and other intangible assets	(98,654)	(103,539)
Prepaid expenses	(9,694)	(9,187)
Total deferred tax liabilities	(333,927)	(276,972)
Total net deferred tax liability before valuation allowance	(147,620)	(143,198)
Less valuation allowance	(83,643)	(79,295)
Net deferred tax liabilities	\$ (231,263)	\$ (222,493)

(1) As of December 31, 2019, the net operating loss carryforwards included (i) state net operating loss carryovers of \$201.8 million which will begin to expire in 2020, (ii) federal net operating loss carryforwards of \$25.5 million which will begin to expire in 2025 and (iii) foreign net operating loss carryforwards of \$145.0 million which will begin to expire in 2020.

(2) As of December 31, 2019, the foreign tax credit carryforwards of \$16.6 million will expire between 2020 and 2024.

The Company has not accrued for any remaining undistributed foreign earnings. These amounts continue to be indefinitely reinvested in foreign operations.

A valuation allowance is required to be established when, based on an evaluation of available evidence, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Accordingly, as of December 31, 2019 and 2018, the Company had a valuation allowance of \$83.6 million and \$79.3 million, respectively. The total allowance as of December 31, 2019 consisted of \$16.5 million of foreign tax credits, \$0.8 million of acquired federal net operating losses, \$10.7 million of state net operating loss carryforwards, \$34.1 million of foreign net operating loss carryforwards, \$14.9 million of deferred tax assets of a Canadian subsidiary and \$6.6 million of realized and unrealized capital losses. The allowance as of December 31, 2018 consisted of \$16.5 million of foreign tax credits, \$0.8 million of acquired federal net operating losses, \$9.6 million of state net operating loss carryforwards and \$22.7 million of foreign net operating loss carryforwards, \$26.6 million of deferred tax assets of a Canadian subsidiary and \$3.1 million of unrealized capital losses.

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The changes to unrecognized tax benefits (excluding related penalties and interest) from January 1, 2017 through December 31, 2019, were as follows (in thousands):

	2019	2018	2017
Unrecognized tax benefits as of January 1	\$ 3,159	\$ 5,121	\$ 1,738
Additions to current year tax positions	—	—	1,457
(Reductions) additions to prior year tax positions	3,354	(625)	2,031
Expirations	(209)	(1,115)	(231)
Foreign currency translation	110	(222)	126
Unrecognized tax benefits as of December 31	<u>\$ 6,414</u>	<u>\$ 3,159</u>	<u>\$ 5,121</u>

At December 31, 2019, 2018 and 2017, the Company had recorded \$6.4 million, \$3.2 million and \$5.1 million, respectively, of unrecognized tax benefits that if recognized would affect the annual effective tax rate. The Company recorded \$3.1 million of unrecognized tax benefits for Canadian Revenue Agency transfer pricing adjustments for which relief from double taxation has been requested. Therefore, an offsetting benefit of \$3.1 million was also recorded resulting in no effect on the annual effective tax rate.

At December 31, 2019, 2018 and 2017 the Company has accrued interest of \$1.7 million, \$0.8 million and \$0.9 million, respectively, relative to unrecognized tax benefits. Interest expense that is recorded as a tax expense against the liability for unrecognized tax benefits for the years ended December 31, 2019, 2018 and 2017 included interest and penalties of \$0.9 million, \$(0.1) million and \$0.5 million, respectively.

The Company files U.S. federal income tax returns as well as income tax returns in various states and foreign jurisdictions. The Company's tax years 2014-2016 are currently under review by the Internal Revenue Service (the "IRS"). The Company does not believe the examination will result in material adjustments to previously filed returns. Additionally, any net operating losses that were generated in prior years and utilized in these years may also be subject to examination by the IRS. The Company may also be subject to examinations by state and local revenue authorities for calendar years 2014 through 2018. The Company has ongoing U.S. state and local jurisdictional audits, as well as Canadian federal and provincial audits, all of which the Company believes will not result in material liabilities.

Due to expiring statute of limitation periods and the resolution of tax audits, the Company believes that total unrecognized tax benefits will decrease by approximately \$0.2 million within the next 12 months.

(14) EARNINGS PER SHARE

The following are computations of basic and diluted earnings per share (in thousands, except for per share amounts):

	For the years ended December 31,		
	2019	2018	2017
Numerator for basic and diluted earnings per share:			
Net income	\$ 97,740	\$ 65,636	\$ 100,739
Denominator:			
Weighted basic shares outstanding	55,845	56,148	57,072
Dilutive effect of equity-based compensation awards	284	192	128
Weighted dilutive shares outstanding	<u>56,129</u>	<u>56,340</u>	<u>57,200</u>
Basic earnings per share	<u>\$ 1.75</u>	<u>\$ 1.17</u>	<u>\$ 1.77</u>
Diluted earnings per share	<u>\$ 1.74</u>	<u>\$ 1.16</u>	<u>\$ 1.76</u>

For the years ended December 31, 2019, 2018 and 2017, all then outstanding performance awards and restricted stock awards were included in the calculation of diluted earnings per share except for 122,785, 79,390 and 152,831 respectively, of performance stock awards for which the performance criteria were not attained at the time and 16,304, 121,803 and 49,373 respectively, of restricted stock awards and performance stock awards which were excluded as their inclusion would have an antidilutive effect.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(15) STOCKHOLDERS' EQUITY

The Company's board of directors has authorized the repurchase of up to \$600.0 million of the Company's common stock. The Company has funded and intends to continue to fund the repurchases through available cash resources. The repurchase program authorizes the Company to purchase the Company's common stock on the open market or in privately negotiated transactions periodically in a manner that complies with applicable U.S. securities laws. The number of shares purchased and the timing of the purchases have depended and will depend on a number of factors including share price, cash required for future business plans, trading volume and other conditions. The Company has no obligation to repurchase stock under this program and may suspend or terminate the repurchase program at any time. During the years ended December 31, 2019, 2018 and 2017, the Company repurchased and retired a total of approximately 0.3 million, 0.8 million and 0.9 million shares, respectively, of the Company's common stock for total costs of approximately \$21.4 million, \$45.1 million and \$49.0 million, respectively. Through December 31, 2019, the Company has repurchased and retired a total of approximately 5.9 million shares of its common stock for approximately \$315.3 million under this program. As of December 31, 2019, an additional \$284.7 million remained available for repurchase of shares under this program.

(16) ACCUMULATED OTHER COMPREHENSIVE LOSS

The changes in accumulated other comprehensive loss by component and related tax (loss) benefit for the years ended December 31, 2019, 2018 and 2017 were as follows (in thousands):

	Foreign Currency Translation Adjustments	Unrealized (Losses) Gains on Available-for- Sale Securities	Unrealized Loss on Interest Rate Hedge	Unfunded Pension Liability	Total
Balance at January 1, 2017	\$ (212,211)	\$ (321)	\$ —	\$ (1,794)	\$ (214,326)
Other comprehensive income before reclassifications	41,636	184	—	146	41,966
Amounts reclassified out of accumulated other comprehensive loss	—	222	—	—	222
Tax loss	—	(231)	—	(38)	(269)
Other comprehensive income	41,636	175	—	108	41,919
Balance at December 31, 2017	(170,575)	(146)	—	(1,686)	(172,407)
Other comprehensive (loss) income before reclassifications	(47,374)	182	(9,579)	124	(56,647)
Amounts reclassified out of accumulated other comprehensive loss	—	—	806	—	806
Tax benefit (loss)	5,024	(105)	—	(42)	4,877
Other comprehensive (loss) income	(42,350)	77	(8,773)	82	(50,964)
Balance at December 31, 2018	(212,925)	(69)	(8,773)	(1,604)	(223,371)
Other comprehensive income (loss) before reclassifications	25,130	(70)	(14,401)	60	10,719
Amounts reclassified out of accumulated other comprehensive loss	—	332	2,335	—	2,667
Tax loss	—	(50)	—	(16)	(66)
Other comprehensive income (loss)	25,130	212	(12,066)	44	13,320
Balance at December 31, 2019	\$ (187,795)	\$ 143	\$ (20,839)	\$ (1,560)	\$ (210,051)

During the year ended December 31, 2018, the Company converted an intercompany loan with a foreign subsidiary to equity, which resulted in losses for tax purposes. The loan had been historically treated as a component of the Company's investment in that subsidiary, and as a result, foreign currency gains and losses on the loan had been accumulated as a component of other comprehensive (loss) income. The subsidiary continues to operate as part of the Company. The tax benefit of \$5.0 million, which was triggered by the conversion, was therefore allocated to other comprehensive (loss) income rather than net income.

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The amounts reclassified out of accumulated other comprehensive loss into the consolidated statement of operations, with presentation location, during the years ended December 31, 2019, 2018, and 2017 were as follows (in thousands):

Other Comprehensive Income Components	For the years ended December 31,			Location
	2019	2018	2017	
Unrealized (losses) gains on available-for-sale securities	\$ (332)	\$ —	\$ (222)	Other income (expense), net
Unrealized loss on interest rate hedge	(2,335)	(806)	—	Interest expense, net of interest income

(17) STOCK-BASED COMPENSATION
Stock-Based Compensation

In 2010, the Company adopted an equity incentive plan (the "2010 Plan"), which provides for awards of up to 6,000,000 shares of common stock (subject to certain anti-dilution adjustments) in the form of (i) stock options, (ii) stock appreciation rights, (iii) restricted stock, (iv) restricted stock units, and (v) certain other stock-based awards. The Company ceased issuing stock options in 2008, and all awards issued to date under the 2010 Plan have been in the form of restricted stock awards and performance stock awards as described below.

As of December 31, 2019 and 2018, the Company had restricted stock awards and performance stock awards outstanding under the 2010 Plan. The restricted stock awards generally vest over three to five years subject to continued employment. The performance stock awards vest depending on the satisfaction of certain performance criteria and continued service conditions as described below.

Total stock-based compensation cost charged to selling, general and administrative expenses for the years ended December 31, 2019, 2018 and 2017 was \$17.8 million, \$16.8 million and \$13.1 million, respectively. The total income tax benefit recognized in the consolidated statements of operations from stock-based compensation was \$3.1 million, \$3.2 million and \$3.7 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Restricted Stock Awards

The following table summarizes information about restricted stock awards for the year ended December 31, 2019:

Restricted Stock	Number of Shares	Weighted Average Grant-Date Fair Value
Unvested at January 1, 2019	657,240	\$ 54.65
Granted	174,114	68.82
Vested	(249,319)	53.99
Forfeited	(59,438)	55.65
Unvested at December 31, 2019	522,597	\$ 59.57

As of December 31, 2019, there was \$20.6 million of total unrecognized compensation cost arising from restricted stock awards. This cost is expected to be recognized over a weighted average period of 2.6 years. The total fair value of restricted stock vested during 2019, 2018 and 2017 was \$16.8 million, \$10.8 million and \$7.3 million, respectively.

Performance Stock Awards

The following table summarizes information about performance stock awards for the year ended December 31, 2019:

Performance Stock	Number of Shares	Weighted Average Grant-Date Fair Value
Unvested at January 1, 2019	213,490	\$ 55.71
Granted	125,034	70.77
Vested	(105,583)	55.68
Forfeited	(28,388)	56.82
Unvested at December 31, 2019	204,553	\$ 64.78

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

As of December 31, 2019, there was \$2.8 million of total unrecognized compensation cost arising from performance stock awards whereby the performance conditions had been met or were deemed probable of vesting. The total fair value of performance awards vested during 2019, 2018 and 2017 was \$8.1 million, \$1.2 million and \$3.0 million, respectively.

(18) COMMITMENTS AND CONTINGENCIES***Legal and Administrative Proceedings***

The Company and its subsidiaries are subject to legal proceedings and claims arising in the ordinary course of business. Actions filed against the Company arise from commercial and employment-related claims including alleged class actions related to sales practices and wage and hour claims. The plaintiffs in these actions may be seeking damages or injunctive relief or both. These actions are in various jurisdictions and stages of proceedings, and some are covered in part by insurance. In addition, the Company's waste management services operations are regulated by federal, state, provincial and local laws enacted to regulate discharge of materials into the environment, remediation of contaminated soil and groundwater or otherwise protect the environment. This ongoing regulation results in the Company frequently becoming a party to legal or administrative proceedings involving all levels of government authorities and other interested parties. The issues involved in such proceedings generally relate to alleged violations of existing permits and licenses or alleged responsibility under federal or state Superfund laws to remediate contamination at properties owned either by the Company or by other parties ("third-party sites") to which either the Company or the prior owners of certain of the Company's facilities shipped waste.

At December 31, 2019 and 2018, the Company had recorded reserves of \$26.0 million and \$25.4 million, respectively, for actual or probable liabilities related to the legal and administrative proceedings in which the Company was then involved, the principal of which are described below. In management's opinion, it is not reasonably possible that the potential liability beyond what has been recorded, if any, that may result from these actions, either individually or collectively, will have a material effect on our financial position, results of operations or cash flows. The Company periodically adjusts the aggregate amount of these reserves when actual or probable liabilities are paid or otherwise discharged, new claims arise, or additional relevant information about existing or probable claims becomes available. As of December 31, 2019 and 2018, the \$26.0 million and \$25.4 million, respectively, of reserves consisted of (i) \$18.4 million and \$17.9 million, respectively, related to pending legal or administrative proceedings, including Superfund liabilities, which were included in remedial liabilities on the consolidated balance sheets, and (ii) \$7.6 million and \$7.5 million, respectively, primarily related to federal, state and provincial enforcement actions, which were included in accrued expenses on the consolidated balance sheets.

As of December 31, 2019, the principal legal and administrative proceedings in which the Company was involved, or which had been terminated during 2019, were as follows:

Ville Mercier. In September 2002, the Company acquired the stock of a subsidiary (the "Mercier Subsidiary") which owns a hazardous waste incinerator in Ville Mercier, Quebec (the "Mercier Facility"). The property adjacent to the Mercier Facility, which is also owned by the Mercier Subsidiary, is now contaminated as a result of actions dating back to 1968, when the Government of Quebec issued to a company unrelated to the Mercier Subsidiary two permits to dump organic liquids into lagoons on the property. In 1999, Ville Mercier and three neighboring municipalities filed separate legal proceedings against the Mercier Subsidiary and the Government of Quebec. In 2012, the municipalities amended their existing statement of claim to seek \$2.9 million (CAD \$) in general damages and \$10.0 million (CAD \$) in punitive damages, plus interest and costs, as well as injunctive relief. Both the Government of Quebec and the Company have filed summary judgment motions against the municipalities. The parties are attempting to negotiate a resolution and hearings on the motions have been delayed. In September 2007, the Quebec Minister of Sustainable Development, Environment and Parks issued a notice pursuant to Section 115.1 of the Environment Quality Act, superseding notices issued in 1992, which are the subject of the pending litigation. The more recent notice notifies the Mercier Subsidiary that, if the Mercier Subsidiary does not take certain remedial measures at the site, the Minister intends to undertake those measures at the site and claim direct and indirect costs related to such measures. The Company has accrued for costs expected to be incurred relative to the resolution of this matter and believes this matter will not have future material effect on its financial position or results of operations.

Safety-Kleen Legal Proceedings. On December 28, 2012, the Company acquired Safety-Kleen, Inc. ("Safety-Kleen") and thereby became subject to the legal proceedings in which Safety-Kleen was a party on that date. In addition to certain Superfund proceedings in which Safety-Kleen has been named as a potentially responsible party as described below under "Superfund Proceedings," the principal such legal proceedings involving Safety-Kleen which were outstanding as of December 31, 2019 were as follows:

Product Liability Cases. Safety-Kleen has been named as a defendant in various lawsuits that are currently pending in various courts and jurisdictions throughout the United States, including approximately 55 proceedings (excluding cases which

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

have been settled but not formally dismissed) as of December 31, 2019, wherein persons claim personal injury resulting from the use of Safety-Kleen's parts cleaning equipment or cleaning products. These proceedings typically involve allegations that the solvent used in Safety-Kleen's parts cleaning equipment contains contaminants and/or that Safety-Kleen's recycling process does not effectively remove the contaminants that become entrained in the solvent during their use. In addition, certain claimants assert that Safety-Kleen failed to warn adequately the product user of potential risks, including a historic failure to warn that solvent contains trace amounts of toxic or hazardous substances such as benzene.

The Company maintains insurance that it believes will provide coverage for these product liability claims (over amounts accrued for self-insured retentions and deductibles in certain limited cases), except for punitive damages to the extent not insurable under state law or excluded from insurance coverage. The Company also believes that these claims lack merit and has historically vigorously defended, and intends to continue to vigorously defend, itself and the safety of its products against all of these claims. Such matters are subject to many uncertainties and outcomes are not predictable with assurance. Consequently, The Company is unable to ascertain the ultimate aggregate amount of monetary liability or financial impact with respect to these matters as of December 31, 2019. From January 1, 2019 to December 31, 2019, 27 product liability claims were settled or dismissed. Due to the nature of these claims and the related insurance, the Company did not incur any expense as insurance provided coverage in full for all such claims. Safety-Kleen may be named in similar, additional lawsuits in the future, including claims for which insurance coverage may not be available.

Superfund Proceedings

The Company has been notified that either the Company (which, since December 28, 2012, includes Safety-Kleen) or the prior owners of certain of the Company's facilities for which the Company may have certain indemnification obligations have been identified as PRPs or potential PRPs in connection with 130 sites which are subject to or are proposed to become subject to proceedings under federal or state Superfund laws. Of the 130 sites, five (including the BR Facility described below) involve facilities that are now owned or leased by the Company and 125 involve third-party sites to which either the Company or the prior owners of certain of the Company's facilities shipped waste. Of the 125 third-party sites, 31 are now settled, 16 are currently requiring expenditures on remediation and 78 are not currently requiring expenditures on remediation.

In connection with each site, the Company has estimated the extent, if any, to which it may be subject, either directly or as a result of any indemnification obligations, for cleanup and remediation costs, related legal and consulting costs associated with PRP investigations, settlements, and related legal and administrative proceedings. The amount of such actual and potential liability is inherently difficult to estimate because of, among other relevant factors, uncertainties as to the legal liability (if any) of the Company or the prior owners of certain of the Company's facilities to contribute a portion of the cleanup costs, the assumptions that must be made in calculating the estimated cost and timing of remediation, the identification of other PRPs and their respective capability and obligation to contribute to remediation efforts, and the existence and legal standing of indemnification agreements (if any) with prior owners, which may either benefit the Company or subject the Company to potential indemnification obligations. The Company believes its potential liability could exceed \$100,000 at 10 of the 125 third-party sites.

BR Facility. The Company acquired in 2002 a former hazardous waste incinerator and landfill in Baton Rouge (the "BR Facility"), for which operations had been previously discontinued by the prior owner. In September 2007, the EPA issued a special notice letter to the Company related to the Devil's Swamp Lake Site ("Devil's Swamp") in East Baton Rouge Parish, Louisiana. Devil's Swamp includes a lake located downstream of an outfall ditch where wastewater and storm water have been discharged, and Devil's Swamp is proposed to be included on the National Priorities List due to the presence of Contaminants of Concern ("COC") cited by the EPA. These COCs include substances of the kind found in wastewater and storm water discharged from the BR Facility in past operations. The EPA originally requested COC generators to submit a good faith offer to conduct a remedial investigation feasibility study directed towards the eventual remediation of the site. In 2018 the Company completed performing corrective actions at the BR Facility under an order issued by the Louisiana Department of Environmental Quality, and has also completed conducting the remedial investigation and feasibility study for Devil's Swamp under an order issued by the EPA. The Company cannot presently estimate the potential additional liability for the Devil's Swamp cleanup until a final remedy is selected by the EPA with issuance of a Record of Decision.

Third-Party Sites. Of the 125 third-party sites at which the Company has been notified it is a PRP or potential PRP or may have indemnification obligations, Clean Harbors has an indemnification agreement at 11 of these sites with ChemWaste, a former subsidiary of Waste Management, Inc., and at six additional of these third-party sites, Safety-Kleen has a similar indemnification agreement with McKesson Corporation. These agreements indemnify the Company (which now includes Safety-Kleen) with respect to any liability at the 17 sites for waste disposed prior to the Company's (or Safety-Kleen's) acquisition of the former subsidiaries of Waste Management and McKesson which had shipped waste to those sites.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Accordingly, Waste Management or McKesson are paying all costs of defending those subsidiaries in those 17 cases, including legal fees and settlement costs. However, there can be no guarantee that the Company's ultimate liabilities for those sites will not exceed the amount recorded or that indemnities applicable to any of these sites will be available to pay all or a portion of related costs. Except for the indemnification agreements which the Company holds from ChemWaste, McKesson and two other entities, the Company does not have an indemnity agreement with respect to any of the 125 third-party sites discussed above.

Federal, State and Provincial Enforcement Actions

From time to time, the Company pays fines or penalties in regulatory proceedings relating primarily to waste treatment, storage or disposal facilities. As of December 31, 2019 and 2018, there were 12 and 10 proceedings, respectively, for which the Company reasonably believes that the sanctions could equal or exceed \$100,000. The Company believes that the fines or other penalties in these or any of the other regulatory proceedings will, individually or in the aggregate, not have a material effect on its financial condition, results of operations or cash flows.

Self-Insurance Liabilities

Under the Company's insurance programs, coverage is obtained for catastrophic exposures, as well as those risks required to be insured by law or contract. The Company's policy is to retain a significant portion of certain expected losses related to workers' compensation, employee medical, comprehensive general liability and vehicle liability. A portion of these self-insured liabilities are managed through its wholly-owned captive insurance subsidiary.

Provisions for losses expected under these programs are recorded based upon the Company's estimates of the aggregate liability for claims. The current deductible per participant per year for the employee medical insurance policy is \$0.8 million. The current deductible per occurrence for workers' compensation is \$1.0 million, general liability is \$2.0 million and vehicle liability is \$2.0 million. The retention per claim for the environmental impairment policy is \$1.0 million. At December 31, 2019 and 2018, the Company had accrued \$59.4 million and \$53.9 million, respectively, for its self-insurance liabilities (exclusive of employee medical insurance) using a risk-free discount rate of 1.52% and 2.96%, respectively.

Anticipated payments for contingencies related to workers' compensation, comprehensive general liability and vehicle liability related claims at December 31, 2019 for each of the next five years and thereafter were as follows (in thousands):

<u>Years ending December 31,</u>		
2020	\$	20,838
2021		12,675
2022		8,951
2023		6,097
2024		4,743
Thereafter		7,659
Undiscounted self-insurance liabilities		60,963
Less: Discount		1,570
Total self-insurance liabilities (included in accrued expenses)	\$	59,393

(19) LEASES

As of December 31, 2019, the Company's lease portfolio was predominately operating leases for real estate, vehicles and rail cars. The Company presents operating lease balances separately on the consolidated balance sheet. The Company's finance leases relate to certain buildings and equipment. The following table presents our finance lease balances and their classification on the consolidated balance sheet as of December 31, 2019 (in thousands):

<u>Finance Lease Balances (Classification)</u>		<u>December 31, 2019</u>
ROU assets (Property, plant and equipment, net)	\$	32,307
Current portion of lease liabilities (Accrued expenses)		801
Long-term portion of lease liabilities (Deferred taxes, unrecognized tax benefits and other long-term liabilities)		34,517

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The Company's lease expense was as follows (in thousands):

	For the year ended December 31, 2019
Operating lease cost	\$ 55,402
Finance lease cost:	
Amortization of ROU assets	1,142
Interest on lease liabilities	1,415
Total finance lease cost	2,557
Short-term lease cost	84,749
Variable lease cost	6,702
Total lease cost	<u>\$ 149,410</u>

Other information related to leases was as follows:

	December 31, 2019
Weighted Average Remaining Lease Term (years)	
Operating leases	5.1
Finance leases	21.3
Weighted Average Discount Rate	
Operating leases	5.29%
Finance leases	4.97%

	For the year ended December 31, 2019
Supplemental Cash Flow Related Disclosures (in thousands)	
Cash paid for amounts included in the measurement of lease liabilities	
Operating cash flows from operating leases	\$ 56,240
Operating cash flows from finance leases	1,415
Financing cash flows from finance leases	586
ROU assets obtained in exchange for operating lease liabilities	17,699
ROU assets obtained in exchange for finance lease liabilities	33,449

At December 31, 2019, the Company's future lease payments under non-cancelable leases that have lease terms in excess of one year were as follows (in thousands):

Years ending December 31,	Operating Leases	Finance Leases
2020	\$ 50,814	\$ 2,733
2021	38,705	2,782
2022	31,052	2,836
2023	22,723	2,895
2024	15,787	2,825
Thereafter	28,444	51,151
Total future lease payments	187,525	65,222
Amount representing interest	(25,526)	(29,904)
Total lease liabilities	<u>\$ 161,999</u>	<u>\$ 35,318</u>

At December 31, 2019, none of the Company's executed leases that had not yet commenced will create significant rights or obligations in the future and its sublease transactions are not material. Additionally, the Company does not have any related party leases, and there were no restrictions or covenants imposed by its leases.

CLEAN HARBORS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Disclosures related to relevant periods prior to adoption of Topic 842

The following is a summary of future minimum payments under operating leases that have initial or remaining non-cancelable lease terms in excess of one year at December 31, 2018 (in thousands):

Year	Total Operating Leases
2019	\$ 56,480
2020	45,467
2021	33,564
2022	24,509
2023	15,253
Thereafter	35,778
Total minimum lease payments	<u>\$ 211,051</u>

During the years ended December 31, 2018 and 2017, rent expense, including short-term rentals, was approximately \$141.1 million and \$125.4 million, respectively.

(20) SEGMENT REPORTING

Segment reporting is prepared on the same basis that the Company's chief executive officer, who is the Company's chief operating decision maker, manages the business, makes operating decisions and assesses performance. The Company is managed and reports as two operating segments; (i) the Environmental Services segment which consists of the Company's historical Technical Services, Industrial Services, Field Services and Oil, Gas and Lodging businesses, and (ii) the Safety-Kleen segment.

Third-party revenue is revenue billed to outside customers by a particular segment. Direct revenues is revenue allocated to the segment providing the product or service. Intersegment revenues represent the sharing of third-party revenues among the segments based on products and services provided by each segment as if the products and services were sold directly to the third-party. The intersegment revenues are shown net. The operations not managed through the Company's operating segments described above are recorded as "Corporate Items."

The following tables reconcile third-party revenues to direct revenues for the years ended December 31, 2019, 2018 and 2017 (in thousands):

	For the year ended December 31, 2019			
	Environmental Services	Safety-Kleen	Corporate Items	Totals
Third-party revenues	\$ 2,092,363	\$ 1,318,691	\$ 1,136	\$ 3,412,190
Intersegment revenues, net	140,577	(140,577)	—	—
Corporate Items, net	4,128	15	(4,143)	—
Direct revenues	<u>\$ 2,237,068</u>	<u>\$ 1,178,129</u>	<u>\$ (3,007)</u>	<u>\$ 3,412,190</u>

	For the year ended December 31, 2018			
	Environmental Services	Safety-Kleen	Corporate Items	Totals
Third-party revenues	\$ 2,003,843	\$ 1,295,355	\$ 1,105	\$ 3,300,303
Intersegment revenues, net	134,104	(134,104)	—	—
Corporate Items, net	3,247	31	(3,278)	—
Direct revenues	<u>\$ 2,141,194</u>	<u>\$ 1,161,282</u>	<u>\$ (2,173)</u>	<u>\$ 3,300,303</u>

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

	For the year ended December 31, 2017			
	Environmental Services	Safety-Kleen	Corporate Items	Totals
Third-party revenues	\$ 1,728,700	\$ 1,213,703	\$ 2,575	\$ 2,944,978
Intersegment revenues, net	125,822	(125,822)	—	—
Corporate Items, net	2,952	5	(2,957)	—
Direct revenues	\$ 1,857,474	\$ 1,087,886	\$ (382)	\$ 2,944,978

The primary financial measure by which the Company evaluates the performance of its segments is Adjusted EBITDA, which consists of net income plus accretion of environmental liabilities, depreciation and amortization, net interest expense, loss on early extinguishment of debt and provision (benefit) for income taxes and excludes other gains, losses and non-cash charges not deemed representative of fundamental segment results and other (income) expense, net. Transactions between the segments are accounted for at the Company's best estimate based on similar transactions with outside customers.

The following table presents Adjusted EBITDA information used by management by reported segment (in thousands):

	For the years ended December 31,		
	2019	2018	2017
Adjusted EBITDA:			
Environmental Services	\$ 446,284	\$ 380,856	\$ 321,310
Safety-Kleen	282,378	282,029	249,811
Corporate Items	(188,345)	(171,880)	(145,464)
Total	540,317	491,005	425,657
Reconciliation to Consolidated Statements of Operations:			
Accretion of environmental liabilities	10,136	9,806	9,460
Depreciation and amortization	300,725	298,625	288,422
Income from operations	229,456	182,574	127,775
Other (income) expense, net	(2,897)	4,510	6,119
Loss on early extinguishment of debt	6,131	2,488	7,891
Gain on sale of businesses	(687)	—	(30,732)
Interest expense, net of interest income	78,670	81,094	85,808
Income from operations before provision (benefit) for income taxes	\$ 148,239	\$ 94,482	\$ 58,689

The following table presents assets by reported segment and in the aggregate (in thousands):

	December 31, 2019	December 31, 2018
Property, plant and equipment, net		
Environmental Services	\$ 939,352	\$ 951,867
Safety-Kleen	555,310	553,220
Corporate Items	93,489	56,891
Total property, plant and equipment, net	\$ 1,588,151	\$ 1,561,978
Goodwill and Permits and other intangibles, net		
Environmental Services		
Goodwill	\$ 212,531	\$ 207,019
Permits and other intangibles, net	89,722	93,313
Total Environmental Services	302,253	300,332
Safety-Kleen		
Goodwill	\$ 312,482	\$ 307,170
Permits and other intangibles, net	329,344	348,562
Total Safety-Kleen	641,826	655,732
Total	\$ 944,079	\$ 956,064

CLEAN HARBORS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Geographic Information

As of December 31, 2019 and 2018, the Company had property, plant and equipment, net of depreciation and amortization and permits and other intangible assets, net of amortization in the following geographic locations (in thousands):

	December 31, 2019		December 31, 2018	
	Total	% of Total	Total	% of Total
Property, plant and equipment, net				
United States	\$ 1,273,205	80.2%	\$ 1,233,949	79.0%
Canada and other foreign	314,946	19.8	328,029	21.0
Total property, plant and equipment, net	\$ 1,588,151	100.0%	\$ 1,561,978	100.0%
Permits and other intangibles, net				
United States	\$ 372,609	88.9%	\$ 393,045	88.9%
Canada and other foreign	46,457	11.1	48,830	11.1
Total permits and other intangibles, net	\$ 419,066	100.0%	\$ 441,875	100.0%

The following table presents the total assets by geographical area (in thousands):

	December 31, 2019	December 31, 2018
United States	\$ 3,413,254	\$ 3,090,311
Canada and other foreign	695,650	648,010
Total	\$ 4,108,904	\$ 3,738,321

(21) QUARTERLY DATA (UNAUDITED)

(in thousands, except per share amounts)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2019				
Total revenues	\$ 780,839	\$ 868,678	\$ 891,668	\$ 871,005
Cost of revenues ⁽¹⁾	564,364	594,933	612,754	615,768
Income from operations	23,734	73,048	80,367	52,307
Other income (expense), net	2,983	(564)	(427)	905
Net income ⁽²⁾	976	36,244	36,369	24,151
Basic earnings per share ⁽³⁾	0.02	0.65	0.65	0.43
Diluted earnings per share ⁽³⁾	0.02	0.65	0.65	0.43

(in thousands, except per share amounts)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2018				
Total revenues	\$ 749,778	\$ 849,140	\$ 843,181	\$ 858,204
Cost of revenues ⁽¹⁾	546,425	583,584	580,685	594,857
Income from operations	10,991	64,353	65,745	41,485
Other (expense) income, net	(299)	846	(996)	(4,061)
Net (loss) income ⁽²⁾	(12,631)	30,747	31,089	16,431
Basic (loss) earnings per share ⁽³⁾	(0.22)	0.55	0.55	0.29
Diluted (loss) earnings per share ⁽³⁾	(0.22)	0.54	0.55	0.29

- (1) Accretion of environmental liabilities and depreciation and amortization are shown separately on the consolidated statements of operations.
- (2) Net income in the third quarters of 2019 and 2018 included a \$6.1 million and \$2.5 million loss on early extinguishment of debt, respectively.
- (3) Earnings (loss) per share are computed independently for each of the quarters presented. Accordingly, the quarterly basic and diluted earnings (loss) per share may not equal the total computed for the year.

CLEAN HARBORS, INC. AND SUBSIDIARIES

SCHEDULE II

VALUATION AND QUALIFYING ACCOUNTS

For the Three Years Ended December 31, 2019

(in thousands)

Allowance for Doubtful Accounts	Balance Beginning of Period	Additions Charged to Operating Expense	Deductions from Reserves ⁽¹⁾	Balance End of Period
2017	\$ 15,046	\$ 7,901	\$ 6,774	\$ 16,173
2018	16,173	15,817	5,622	26,368
2019	26,368	2,408	6,283	22,493

(1) Amounts deemed uncollectible, net of recoveries.

Revenue Allowance⁽²⁾	Balance Beginning of Period	Additions Charged to Revenue	Deductions from Reserves	Balance End of Period
2017	\$ 14,203	\$ 24,862	\$ 27,439	\$ 11,626
2018	11,626	41,338	35,017	17,947
2019	17,947	35,549	37,278	16,218

(2) Due to the nature of the Company's businesses and the invoices that result from the services provided, customers may withhold payments and attempt to renegotiate amounts invoiced. In addition, for some of the services provided, the Company's invoices are based on quotes that can either generate credits or debits when the actual revenue amount is known. Based on industry knowledge and historical trends, the Company records a revenue allowance accordingly. This practice causes the volume of activity flowing through the revenue allowance during the year to be higher than the balance at the end of the year. Increases in overall sales volumes and the expansion of the customer base in recent years have also increased the volume of additions and deductions to the allowance during the year. The revenue allowance is intended to cover the net amount of revenue adjustments that may need to be credited to customers' accounts in future periods. Management determines the appropriate total revenue allowance by evaluating the following factors on a customer-by-customer basis as well as on a consolidated level: trends in adjustments to previously billed amounts, existing economic conditions and other information as deemed applicable. Revenue allowance estimates can differ materially from the actual adjustments, but historically the revenue allowance has been sufficient to cover the net amount of the reserve adjustments issued in subsequent reporting periods.

Valuation Allowance on Deferred Tax Assets	Balance Beginning of Period	Additions Charged to Income Tax Expense	Other Changes to Reserves	Balance End of Period
2017	\$ 55,189	\$ 9,052	\$ 4,114	\$ 68,355
2018	68,355	10,466	474	79,295
2019	79,295	4,459	(111)	83,643

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

Based on an evaluation under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, as of the end of the period covered by this Annual Report on Form 10-K, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures (as defined under Rule 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) were effective as of December 31, 2019 to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms and is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Management's Annual Report on Internal Control Over Financial Reporting

The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting, as that term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of the Company's management, including the Chief Executive Officer and Chief Financial Officer, the Company conducted an evaluation of its internal control over financial reporting based on the framework in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

The Company's management evaluated the effectiveness of Clean Harbors internal control over financial reporting as of December 31, 2019. Based on their evaluation under the framework in *Internal Control—Integrated Framework (2013)*, the Company's management concluded that the Company maintained effective internal control over financial reporting as of December 31, 2019 based on the criteria in the *Internal Control—Integrated Framework (2013)*.

Deloitte & Touche LLP, the independent registered public accounting firm that audited the Company's consolidated financial statements, has issued an attestation report on the effectiveness of the Company's internal control over financial reporting as of December 31, 2019, which is included below in this Item 9A of this Annual Report on Form 10-K.

Changes in Internal Control over Financial Reporting

There were no changes in the Company's internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Exchange Act Rules 13a-15 or 15d-15 that was conducted during the quarter ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Limitations on the Effectiveness of Controls

The Company's management, including the Chief Executive Officer and Chief Financial Officer, does not expect that the Company's disclosure controls and procedures or the Company's internal control over financial reporting will prevent all errors and all fraud.

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.

Further, the design of disclosure controls and procedures and internal control over financial reporting must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations of controls and procedures and internal control over financial reporting, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the Company have been detected.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Clean Harbors, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Clean Harbors, Inc. and subsidiaries (the “Company”) 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 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 COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2019, of the Company and our report dated February 26, 2020 expressed an unqualified opinion on those financial statements.

Basis for Opinion

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

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

Definition and Limitations of Internal Control over Financial Reporting

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

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

/s/ Deloitte & Touche LLP

Boston, Massachusetts
February 26, 2020

ITEM 9B. OTHER INFORMATION

Not applicable.

PART III

Except for the information set forth below under Item 12 with respect to securities authorized for issuance under the registrant's equity compensation plans, the information called for by Item 10 (Directors, Executive Officers and Corporate Governance), Item 11 (Executive Compensation), Item 12 (Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters), Item 13 (Certain Relationships and Related Transactions and Director Independence) and Item 14 (Principal Accountant Fees and Services) is incorporated herein by reference to the registrant's definitive proxy statement for its 2020 annual meeting of shareholders, which definitive proxy statement will be filed with the Securities and Exchange Commission by April 22, 2020.

For the purpose of calculating the aggregate market value of the voting stock of the registrant held by non-affiliates as shown on the cover page of this report, it has been assumed that the directors and executive officers of the registrant, as will be set forth in the Company's definitive proxy statement for its 2020 annual meeting of shareholders, are the only affiliates of the registrant. However, this should not be deemed to constitute an admission that all of such persons are, in fact, affiliates or that there are not other persons who may be deemed affiliates of the registrant.

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

In addition to the information about the security ownership of certain beneficial owners and management and related stockholder matters which is incorporated herein by reference to the Company's definitive proxy statement for the Company's 2020 annual meeting of shareholders, the following table includes information as of December 31, 2019 regarding shares of common stock authorized for issuance under the Company's equity compensation plan. The Company's shareholders previously approved the plan.

Plan Category	Number of securities to be issued upon exercise of outstanding options and rights(a)	Weighted average exercise price of outstanding options and rights(b)	Number of securities remaining available for future issuance under equity compensation plan (excluding securities reflected in column (a))(c)
Equity compensation plan approved by security holders ⁽¹⁾	—	\$ —	3,853,811

- (1) Includes the Company's 2010 Stock Incentive Plan (the "2010 Plan") under which there were on December 31, 2019 no outstanding options but 3,853,811 shares were available for grant of stock options, stock appreciation rights, restricted stock, restricted stock units and certain other stock-based awards. See Note 17, "Stock-Based Compensation," to the Company's consolidated financial statements included in Item 8, "Financial Statements and Supplementary Data," in this report.

PART IV**ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES***(a) Documents Filed as a Part of this Report*

	<u>Page</u>
1. Financial Statements:	
Report of Independent Registered Public Accounting Firm	44
Consolidated Balance Sheets as of December 31, 2019 and 2018	46
Consolidated Statements of Operations for the Three Years Ended December 31, 2019	47
Consolidated Statements of Comprehensive Income for the Three Years Ended December 31, 2019	48
Consolidated Statements of Cash Flows for the Three Years Ended December 31, 2019	49
Consolidated Statements of Stockholders' Equity for the Three Years Ended December 31, 2019	50
Notes to Consolidated Financial Statements	51
2. Financial Statement Schedule:	
Schedule II Valuation and Qualifying Accounts for the Three Years Ended December 31, 2019	85

All other schedules are omitted because they are not applicable, not required, or because the required information is included in the financial statements or notes thereto.

3. Exhibits:

The list of exhibits filed as part of this annual report on Form 10-K is set forth on the Exhibit Index immediately following the signature page to this report, and such Exhibit Index is incorporated herein by reference.

Exhibits to this annual report on Form 10-K have been included only with the copies of the Form 10-K filed with the Securities and Exchange Commission. Upon request to the Company and payment of a reasonable fee, copies of the individual exhibits will be furnished. The Company undertakes to furnish to the Commission upon request copies of instruments (in addition to the exhibits listed below) relating to the Company's acquisitions and long-term debt.

ITEM 16. FORM 10-K SUMMARY

None

EXHIBIT INDEX

Item No.	Description	Location
2.1	Acquisition Agreement by and between Safety-Kleen Services, Inc., as Seller, and Clean Harbors, Inc., as Purchaser, dated as of February 22, 2002	(1)
2.2	First Amendment to Acquisition Agreement by and between Safety-Kleen Services, Inc., as Seller, and Clean Harbors, Inc., as Purchaser, dated as of March 8, 2002	(2)
2.3	Second Amendment to Acquisition Agreement by and between Safety-Kleen Services, Inc. as Seller, and Clean Harbors, Inc. as Purchaser, dated as of April 30, 2002	(3)
2.4	Third Amendment to Acquisition Agreement by and between Safety-Kleen Services, Inc., as Seller, and Clean Harbors, Inc., as Purchaser, dated as of September 6, 2002	(4)
2.5	Fourth Amendment to Acquisition Agreement by and between Safety-Kleen Services, Inc., as Seller and Clean Harbors, Inc., as Purchaser, dated as of July 14, 2003	(5)
2.6	Agreement and Plan of Merger dated as of October 26, 2012 among Safety-Kleen, Inc., Clean Harbors, Inc., and CH Merger Sub, Inc.	(6)
3.1A	Restated Articles of Organization of Clean Harbors, Inc.	(7)
3.1B	Articles of Amendment [as filed on May 9, 2011] to Restated Articles of Organization of Clean Harbors	(8)
3.4D	Amended and Restated By-Laws of Clean Harbors, Inc.	(9)
3.4E	Description of rights of holders of Clean Harbors, Inc. common stock	(10)
4.34	Fifth Amended and Restated Credit Agreement dated as of November 1, 2016 among Clean Harbors, Inc., as the U.S. Borrower, Clean Harbors Industrial Services Canada, Inc., as the Canadian Borrower, Bank of America, N.A., as Administrative Agent, and the Lenders party thereto	(11)
4.34B	Amended and Restated Security Agreement (Canadian Domiciled Loan Parties) dated as of November 1, 2016 among Clean Harbors Industrial Services Canada, Inc., as the Canadian Borrower and a Grantor, the subsidiaries of Clean Harbors, Inc. listed on Annex A thereto or that thereafter become a party thereto as Grantors, and Bank of America, N.A., as Agent	(11)
4.34C	Amended and Restated Guarantee (U.S. Domiciled Loan Parties-U.S. Facility Obligations) dated as of November 1, 2016 executed by the U.S. Domiciled Subsidiaries of Clean Harbors, Inc. named therein in favor of Bank of America, N.A., as Agent for itself and the other U.S. Facility Secured Parties	(11)
4.34D	Amended and Restated Guarantee (Canadian Domiciled Loan Parties-Canadian Facility Obligations) dated as of November 1, 2016 executed by the Canadian Domiciled Subsidiaries of Clean Harbors, Inc. named therein in favor of Bank of America, N.A., as Agent for itself and the other Canadian Facility Secured Parties	(11)
4.34E	Amended and Restated Guarantee (U.S. Domiciled Loan Parties-Canadian Facility Obligations) dated as of November 1, 2016 executed by Clean Harbors, Inc. and the U.S. Domiciled Subsidiaries of Clean Harbors, Inc. named therein in favor of Bank of America, N.A., as Agent for itself and the other Canadian Facility Secured Parties	(11)
4.34F	First Amendment to Credit Agreement, dated as of June 30, 2017, by and among Clean Harbors, Inc., Clean Harbors Industrial Services Canada, Inc., the other Loan Parties party thereto, certain of the Lenders party thereto, which constitute the "Required Lenders", and Bank of America, N.A., as Administrative Agent	(12)
4.34G	Second Amended and Restated Security Agreement (U.S. Domiciled Loan Parties) dated as of June 30, 2017, among Clean Harbors, Inc., as the U.S. Borrower and a Grantor, the subsidiaries of Clean Harbors, Inc. listed on Annex A thereto or that thereafter become a party thereto as Grantors, and Bank of America, N.A., as Agent	(12)
4.34H	Second Amendment to Credit Agreement, dated as of July 19, 2018, by and among Clean Harbors, Inc., Clean Harbors Industrial Services Canada, the Other Loan Parties party thereto, certain of the Lenders party thereto which constitute the "Required Lenders," and Bank of America, N.A., as Agent.	(13)
4.34I	Third Amendment to Credit Agreement, dated as of July 2, 2019, by and among Clean Harbors, Inc., Clean Harbors Industrial Services Canada, Inc., the Other Loan Parties party thereto, certain of the Lenders party thereto which constitute the "Required Lenders," and Bank of America, N.A., as Agent	(14)
4.34J	Fourth Amendment to Credit Agreement, dated as of February 20, 2020, by and among Clean Harbors, Inc., Clean Harbors Industrial Services Canada, Inc., the Other Loan Parties party thereto, certain of the Lenders party thereto which constitute the "Required Lenders," and Bank of America, N.A., as Agent	

Filed herewith

Item No.	Description	Location
4.43	Credit Agreement dated as of June 30, 2017, among the Financial Institutions party thereto, as Lenders, Goldman Sachs Lending Partners LLC, as Administrative Agent and Collateral Agent, Clean Harbors, Inc., as Borrower, and the Loan Guarantors from time to time party thereto	(12)
4.43A	Security Agreement dated as of June 30, 2017, among Clean Harbors, Inc. and its subsidiaries listed on Annex A thereto or that become a party thereto as the Grantors, and Goldman Sachs Lending Partners LLC, as the Agent	(12)
4.43B	First Amendment to Credit Agreement dated as of June 30, 2017, among the Financial Institutions party thereto, as Lenders, Goldman Sachs Lending Partners LLC, as Administrative Agent and Collateral Agent, Clean Harbors, Inc., as Borrower, and the Loan Guarantors from time to time party thereto.	(15)
4.43C	Incremental Facility Amendment dated July 19, 2018, to Credit Agreement dated as of June 30, 2017, among the Financial Institutions party thereto, as Lenders, Goldman Sachs Lending Partners LLC, as Administrative Agent and Collateral Agent, Clean Harbors, Inc., as Borrower, and the Loan Guarantors from time to time party thereto	(13)
4.44	Intercreditor Agreement dated as of June 30, 2017, among Clean Harbors, Inc., and the subsidiaries of Clean Harbors, Inc. listed on the signature pages thereto (together with any subsidiary that becomes a party thereto after the date thereof), Bank of America, N.A., as the Initial ABL Agent, and Goldman Sachs Lending Partners LLC, as agent under the Term Loan Agreement	(12)
4.45	Indenture dated as of July 2, 2019, among Clean Harbors, Inc., as Issuer, the subsidiaries of Clean Harbors, Inc. named therein as Guarantors, and U.S. Bank National Association, as Trustee	(14)
10.43*	Key Employee Retention Plan	(16)
10.43A*	Form of Severance Agreement under Key Employee Retention Plan with Confidentiality and Non-Competition Agreement	(17)
10.52C*	Clean Harbors, Inc. Management Incentive Plan [as amended and restated effective January 1, 2017]	(18)
10.54*	Clean Harbors, Inc. 2010 Stock Incentive Plan [as amended on May 10, 2010]	(19)
10.54A*	Revised form of Restricted Stock Award Agreement [Non-Employee Director] [for use under 2010 Stock Incentive Plan]	(17)
10.54B*	Revised form of Restricted Stock Award Agreement [Employee] [for use under Clean Harbors, Inc. 2010 Stock Incentive Plan]	(17)
10.54C*	Revised form of Performance-Based Restricted Stock Award Agreement [for use under Clean Harbors, Inc. 2010 Stock Incentive Plan]	(17)
10.54D*	Amendment to Section 8 and 10(i) of the Company's 2010 Stock Incentive Plan	(20)
10.56*	Mike Battles accepted offer letter effective as of January 6, 2016	(21)
10.57*	Clean Harbors, Inc. 2019 CEO Annual Incentive Bonus Plan	(22)
21	Subsidiaries	Filed herewith
23	Consent of Independent Registered Public Accounting Firm	Filed herewith
24	Power of Attorney	Filed herewith
31.1	Rule 13a-14a/15d-14(a) Certification of the CEO Alan S. McKim	Filed herewith
31.2	Rule 13a-14a/15d-14(a) Certification of the CFO Michael L. Battles	Filed herewith
32	Section 1350 Certifications	Filed herewith
101	The following materials from the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019, formatted in iXBRL (Inline eXtensible Business Reporting Language): (i) Consolidated Balance Sheets, (ii) Consolidated Statements of Operations, (iii) Consolidated Statements of Comprehensive Income, (iv) Consolidated Statements of Cash Flows, (v) Consolidated Statements of Stockholders' Equity and (vi) Notes to Consolidated Financial Statements, tagged as blocks of text	(23)
104	Cover page from the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019, formatted in iXBRL and contained in Exhibit 101.	

* A "management contract or compensatory plan or arrangement" filed as an exhibit to this report pursuant to Item 15(a)(3) of Form 10-K.

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- (1) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on February 28, 2002.
- (2) Incorporated by reference to the similarly numbered exhibit to the Company's Form 10-K Annual Report for the Year ended December 31, 2001.
- (3) Incorporated by reference to the similarly numbered exhibit to the Company's Form 10-Q Quarterly Report for the Quarterly Period ended March 31, 2002.
- (4) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on September 25, 2002.
- (5) Incorporated by reference to the similarly numbered exhibit to the Company's Form 10-Q Quarterly Report for the Quarterly Period ended June 30, 2003.
- (6) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on October 31, 2012.
- (7) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on May 19, 2005.
- (8) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on May 12, 2011.
- (9) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on December 22, 2014.
- (10) Incorporated by reference to prospectus supplement dated November 28, 2012 filed on November 28, 2012 under the Company's Registration Statement on Form S-3 (File No. 333-185141).
- (11) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on November 2, 2016.
- (12) Incorporated by reference to the similarly numbered exhibit to the Company's 8-K Report filed on June 30, 2017.
- (13) Incorporated by reference to the similarly numbered exhibit to the Company's Report on Form 8-K filed on July 20, 2018.
- (14) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on July 3, 2019.
- (15) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on April 17, 2018.
- (16) Incorporated by reference to the similarly numbered exhibit to the Company's Form 10-Q Quarterly Report for the quarterly period ended March 31, 1999.
- (17) Incorporated by reference to the similarly numbered exhibit to the Company's Form 10-K Annual Report for the Year ended December 31, 2010.
- (18) Incorporated by reference to Appendix B to the Company's definitive proxy statement for its 2017 annual meeting of shareholders filed on April 26, 2017.
- (19) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on May 14, 2010.
- (20) Incorporated by reference to Appendix B to the Company's definitive proxy statement for its annual meeting of shareholders filed on March 22, 2013.
- (21) Incorporated by reference to the similarly numbered exhibit to the Company's Form 8-K Report filed on January 11, 2016.
- (22) Incorporated by reference to Appendix A to the Company's definitive proxy statement for its 2019 annual meeting of shareholders filed on April 24, 2019.
- (23) These interactive data files are furnished herewith and deemed not filed or part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, as amended, are deemed not filed for

purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and otherwise are not subject to liability under those sections.

FOURTH AMENDMENT TO CREDIT AGREEMENT

This FOURTH AMENDMENT TO CREDIT AGREEMENT, dated as of February 20, 2020 (this "Fourth Amendment"), is entered into by and among CLEAN HARBORS, INC., a Massachusetts corporation (the "U.S. Borrower"), CLEAN HARBORS INDUSTRIAL SERVICES CANADA, INC., an Alberta corporation (the "Canadian Borrower" and, together with the U.S. Borrower, the "Borrowers"), the other Loan Parties party hereto, certain of the Lenders party hereto which constitute the "Required Lenders", BANK OF AMERICA, N.A., as Administrative Agent (in such capacity, together with its successors and assigns, the "Agent"), and BANK OF AMERICA, N.A. and JPMORGAN CHASE BANK, N.A., each as Issuing Banks.

W I T N E S S E T H:

WHEREAS, the Borrowers, the lenders from time to time party thereto (collectively, the "Lenders" and each individually, a "Lender") and the Agent are, among others, parties to the Fifth Amended and Restated Credit Agreement dated as of November 1, 2016 (as amended by that certain First Amendment to Credit Agreement, dated as of June 30, 2017, as further amended by that certain Second Amendment to Credit Agreement, dated as of July 19, 2018, as further amended by that certain Third Amendment to Credit Agreement, dated as of July 2, 2019, and as further amended, modified and supplemented from time to time prior to the date hereof, the "Credit Agreement"), pursuant to which the Lenders and the Issuing Banks, subject to the terms and conditions contained therein, agreed to make loans and other financial accommodations to the U.S. Borrower and the Canadian Borrower; and

WHEREAS, the Borrowers have requested that the Agent, the Issuing Banks and the Required Lenders effect certain amendments to the Credit Agreement as more specifically set forth herein, and the Agent, the Issuing Banks and the Required Lenders are willing to effect such amendments to the Credit Agreement on the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties signatory hereto agree as follows:

1. Defined Terms. Except as otherwise defined in this Fourth Amendment, terms used herein that are not otherwise defined shall have the meanings given to those terms in the Credit Agreement (as amended hereby).

2. Amendment to Credit Agreement. Subject to the satisfaction of the conditions precedent specified in Section 4 below, the following amendments shall be incorporated into the Credit Agreement effective as of the Effective Date:

(a) Section 1.1 of the Credit Agreement is hereby amended by inserting the following defined terms in the appropriate alphabetical order:

"Alternative Currency: any currency (other than Dollars and Canadian Dollars) which the U.S. Borrower, the Agent, and Bank of America (as Issuing Bank) agree in their sole discretion to include as a currency in which a U.S. Letter of Credit may be issued; provided that such requested currency is an Eligible Currency.

Eligible Currency: means any lawful currency other than Dollars and Canadian Dollars that is readily available, freely transferable and convertible into Dollars in the international interbank market available to the applicable Issuing Bank in such market and as to which a Dollar Equivalent may be readily calculated. If, after the designation by the Agent and the applicable Issuing Bank of any currency as an Alternative Currency, any change in currency controls or exchange regulations, or any change in the national or international financial, political or economic conditions imposed in the country in which such currency is issued, results in, in the reasonable opinion of the applicable Issuing Bank, (a) such currency no longer being readily available, freely transferable and convertible into Dollars, (b) a Dollar Equivalent no longer being readily calculable with respect to such currency, (c) providing such currency no longer being practicable for the Issuing Bank or (d) such currency no longer being a currency in which the applicable Issuing Bank is willing, in its sole discretion, to make issuances, fundings, disbursements, settlements and payments in respect of any Letter of Credit (each of the foregoing clauses, a "Disqualifying Event"), then such Issuing Bank shall promptly notify the Agent and the U.S. Borrower, and such country's currency shall no longer be an Alternative Currency until such time as the Disqualifying Event(s) no longer exist. Within five (5) Business Days after receipt of such notice from the applicable Issuing Bank, the U.S. Borrower shall Cash Collateralize that portion of the LC Obligations comprised of the aggregate undrawn amount of Letters of Credit to the extent not otherwise Cash Collateralized."

(b) Section 1.1 of the Credit Agreement is hereby amended by deleting the definitions of "Business Day", "Exchange Rate", and "LC Conditions" in their entirety and inserting in lieu thereof the following, respectively:

“**Business Day:** any day excluding Saturday, Sunday and any other day that is a legal holiday under the laws of The Commonwealth of Massachusetts or is a day on which banking institutions located in such state are closed; and when used with reference to (a) a LIBOR Loan, shall also exclude any day on which banks are not open for the transaction of banking business in London, United Kingdom, (b) a Canadian Revolver Loan, shall also exclude a day on which banks in Toronto, Ontario, Canada are not open for the transaction of banking business, and (c) any issuance, fundings, disbursements, settlements and payments in a currency other than Dollars in respect of any Letter of Credit denominated in a currency other than Dollars, means any such day on which banks are open for foreign exchange business in the principal financial center of the country of such currency.

Exchange Rate: on any date, (a) with respect to Canadian Dollars in relation to Dollars, the spot rate as quoted by Bank of America as its noon spot rate at which Dollars are offered on such date for Canadian Dollars, (b) with respect to Dollars in relation to Canadian Dollars, the spot rate as quoted by Bank of America as its noon spot rate at which Canadian Dollars are offered on such date for Dollars, and (c) with respect to any Alternative Currency in relation to Dollars, the spot rate as quoted by Bank of America as its noon spot rate at which Dollars are offered on such date for such Alternative Currency.

LC Conditions: the following conditions necessary for the issuance of a Letter of Credit: (a) each of the conditions set forth in **Section 6.2** (or with respect to Letters of Credit issued on the Closing Date, in **Section 6.1**); (b) after giving effect to the issuance of a Letter of Credit for the account of the U.S. Borrower, the Dollar Equivalent of the total U.S. LC Obligations (excluding amounts specified in **clause (c)** of such definition) do not exceed the U.S. Letter of Credit Sublimit and no U.S. Overadvance exists or would result therefrom; (c) after giving effect to the issuance of a Letter of Credit for the account of the Canadian Borrower, total Canadian LC Obligations (excluding amounts specified in **clause (c)** of such definition) do not exceed the Canadian Letter of Credit Sublimit and no Canadian Overadvance exists or would result therefrom; (d) the expiration date of such Letter of Credit is (i) no more than three hundred sixty five (365) days from issuance, in the case of standby Letters of Credit; provided that such Letters of Credit may contain automatic extension provisions in accordance with **Section 2.2.1(e)** or **Section 2.3.1(e)**, as applicable, (ii) no more than one hundred twenty (120) days from issuance, in the case of documentary Letters of Credit, and (iii) in all cases for all letters of credit and letters of guarantee: (A) at least fifteen (15) Business Days prior to the Facility Termination Date or (B) with the consent of Agent and the applicable Issuing Bank, no later than the Facility Termination Date; (e) with respect to the issuance of Letters of Credit for the account of the U.S. Borrower, the Letter of Credit and payments thereunder are denominated in Dollars, Canadian Dollars, or an Alternative Currency; (f) with respect to the issuance of Letters of Credit for the account of the Canadian Borrower, the Letter of Credit and payments thereunder are denominated in Dollars or Canadian Dollars; and (g) the form of the proposed Letter of Credit is reasonably satisfactory to the Agent and the applicable Issuing Bank in their discretion.”

(c) Section 1.6 of the Credit Agreement is hereby amended by deleting such section in its entirety and inserting the following in

lieu thereof:

“**1.6 Letter of Credit Amounts.** Unless otherwise specified herein, the amount of a Letter of Credit at any time shall be deemed to be the Dollar Equivalent of the stated amount of such Letter of Credit in effect at such time; provided, however, that with respect to any Letter of Credit that, by its terms or the terms of any LC Document related thereto, provides for one or more automatic increases in the stated amount thereof, the amount of such Letter of Credit shall be deemed to be the Dollar Equivalent of the maximum stated amount of such Letter of Credit after giving effect to all such increases, whether or not such maximum stated amount is in effect at such time.”

(d) The Credit Agreement is hereby amended by adding the following new Section 1.7 in the appropriate numerical order:

“**1.7 LLC Divisions and Series.** Any reference herein to a merger, transfer, consolidation, amalgamation, assignment, sale, disposition or transfer, or similar term, shall be deemed to apply to a division of or by a limited liability company, or an allocation of assets to a series of a limited liability company (or the unwinding of such a division or allocation), as if it were a merger, transfer, consolidation, amalgamation, assignment, sale, disposition or transfer, or similar term, as applicable, to, of or with a separate Person. Any division of a limited liability company shall constitute a separate Person hereunder (and each division of any limited liability company that is a Subsidiary, joint venture or any other like term shall also constitute such a Person or entity).”

(e) Section 2.2.1 of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof the following:

“Issuance of Letters of Credit. U.S. Issuing Bank agrees to issue letters of credit for the account of the U.S. Borrower (“U.S. Letters of Credit”) from time to time until (x) fifteen (15) Business Days prior to the Facility Termination Date (or until the U.S. Revolver Commitment Termination Date, if earlier) or (y) with the consent of the Agent and U.S. Issuing Bank, the Facility Termination Date (or until the U.S. Revolver Commitment Termination Date, if earlier), on the terms set forth herein, including the following:”

(f) Section 2.2.1(a) of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof the following:

“(a) The U.S. Borrower acknowledges that U.S. Issuing Bank’s willingness to issue any U.S. Letter of Credit is conditioned upon U.S. Issuing Bank’s receipt of an LC Application with respect to the requested U.S. Letter of Credit, as well as such other instruments and agreements as U.S. Issuing Bank may customarily require for issuance of a letter of credit of similar type and amount. U.S. Issuing Bank shall have no obligation to issue any U.S. Letter of Credit unless (i) U.S. Issuing Bank receives an LC Request and LC Application at least three (3) Business Days prior to the requested date of issuance; (ii) each LC Condition is satisfied; (iii) if a Defaulting Lender that is a U.S. Lender exists, such Defaulting Lender or the U.S. Borrower have entered into arrangements satisfactory to the Agent and U.S. Issuing Bank to eliminate any funding risk associated with such Defaulting Lender (it being understood that Cash Collateralization of a Defaulting Lender’s Pro Rata share of the requested U.S. Letter of Credit is satisfactory to the Agent and U.S. Issuing Bank); and (iv) with respect to an Alternative Currency, such U.S. Issuing Bank does, as of the issuance date of the requested U.S. Letter of Credit, issue Letters of Credit in the requested currency. If U.S. Issuing Bank receives written notice from a U.S. Lender at least five (5) Business Days before the requested date of issuance of a U.S. Letter of Credit that any LC Condition has not been satisfied, U.S. Issuing Bank shall have no obligation to issue the requested U.S. Letter of Credit (or any other) until such notice is withdrawn in writing by that Lender or until the Required Facility Lenders have waived such condition in accordance with this Agreement. Prior to receipt of any such notice, U.S. Issuing Bank shall not be deemed to have knowledge of any failure of LC Conditions. No U.S. Letter of Credit denominated in any Alternative Currency may be issued by any U.S. Issuing Bank other than Bank of America or an Affiliate of Bank of America.”

(g) Section 2.2.1(b) of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof the following:

“(b) Letters of Credit may be requested by the U.S. Borrower only (i) to support obligations of a U.S. Domiciled Loan Party incurred in the Ordinary Course of Business; or (ii) for other purposes as the Agent may approve from time to time in writing. The renewal or extension of any U.S. Letter of Credit shall be treated as the issuance of a new U.S. Letter of Credit, except that delivery of a new LC Application may be required at the discretion of U.S. Issuing Bank. Notwithstanding that a U.S. Letter of Credit issued or outstanding hereunder is in support of obligations of a U.S. Domiciled Loan Party incurred in the Ordinary Course of Business or for other purposes as the Agent may approve from time to time in writing, the U.S. Borrower shall be obligated to reimburse, indemnify and compensate the applicable Issuing Bank hereunder for any and all drawings under such Letter of Credit as if such Letter of Credit had been issued solely for the account of the U.S. Borrower. The U.S. Borrower irrevocably waives any and all defenses that might otherwise be available to it as a guarantor or surety of any or all of the obligations of any such U.S. Domiciled Loan Party or other Subsidiary in respect of such Letter of Credit. The U.S. Borrower hereby acknowledges that the issuance of U.S. Letters of Credit for the account of U.S. Domiciled Loan Parties or other Subsidiaries inures to the benefit of the U.S. Borrower, and that the U.S. Borrower’s business derives substantial benefits from the businesses of such U.S. Domiciled Loan Parties or other Subsidiaries.”

(h) Section 2.2.2(a) of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof the following:

“(a) If U.S. Issuing Bank honors any request for payment under a U.S. Letter of Credit, the U.S. Borrower shall pay to U.S. Issuing Bank, on the same day (“U.S. Reimbursement Date”), the amount paid by U.S. Issuing Bank under such U.S. Letter of Credit, together with interest at the interest rate for U.S. Base Rate Loans from the U.S. Reimbursement Date until payment by the U.S. Borrower. The U.S. Borrower shall make such payment to the applicable U.S. Issuing Bank in Dollars, unless, in the case of a Letter of Credit denominated in Canadian Dollars or an Alternative Currency, such Issuing Bank (at its option) shall have specified in such notice that it

will require reimbursement in Canadian Dollars or the applicable Alternative Currency. In the case of any such reimbursement in Dollars of a drawing under a Letter of Credit denominated in Canadian Dollars or an Alternative Currency, the applicable U.S. Issuing Bank shall notify the U.S. Borrower of the Dollar Equivalent of the amount of the drawing promptly following the determination thereof. On each U.S. Reimbursement Date, the U.S. Borrower shall reimburse such U.S. Issuing Bank in an amount equal to the amount of such drawing and in the applicable currency. In the event that (i) a drawing denominated in Canadian Dollars or an Alternative Currency is to be reimbursed in Dollars and (ii) the Dollar amount paid by the U.S. Borrower, whether on or after the U.S. Reimbursement Date, shall not be adequate on the date of that payment to purchase in accordance with normal banking procedures a sum denominated in the Alternative Currency equal to the drawing, the U.S. Borrower agrees, as a separate and independent obligation, to indemnify the applicable U.S. Issuing Bank for the loss resulting from its inability on that date to purchase the Alternative Currency in the full amount of the drawing. The obligation of the U.S. Borrower to reimburse U.S. Issuing Bank for any payment made under a U.S. Letter of Credit shall be absolute, unconditional and irrevocable, and shall be paid under any and all circumstances whatsoever without regard to any lack of validity or enforceability of any such U.S. Letter of Credit, any adverse change in the relevant exchange rates or in the availability of any relevant Alternative Currency to the U.S. Borrower or in the relevant currency markets generally, the existence of any claim, setoff, defense or other right that the U.S. Borrower or any other U.S. Domiciled Loan Parties may have at any time against the beneficiary, or any other event or circumstance whatsoever, whether or not similar to any of the foregoing, that might, but for the provisions of this Section, constitute a legal or equitable discharge of, or provide a right of setoff against, the U.S. Borrower's obligations hereunder. Whether or not the Loan Party Agent submits a Notice of Borrowing, the U.S. Borrower shall be deemed to have requested a Borrowing of U.S. Base Rate Loans in an amount necessary to pay all amounts due U.S. Issuing Bank on any U.S. Reimbursement Date and each U.S. Lender agrees to fund its Pro Rata share of such Borrowing whether or not the U.S. Revolver Commitments have terminated, any U.S. Overadvance exists or is created thereby, or the conditions in **Section 6** are satisfied."

(i) Section 2.2.2(b) of the Credit Agreement is hereby amended by adding "in Dollars" immediately after "unconditionally pay"

appears therein.

(j) Section 2.2.3 of the Credit Agreement is hereby amended by deleting such section in its entirety and inserting in lieu thereof the

following:

"2.2.3 Cash Collateral. If any U.S. LC Obligations, whether or not then due or payable, shall for any reason be outstanding at any time (a) that an Event of Default exists, (b) that a U.S. Overadvance exists, (c) after the U.S. Revolver Commitment Termination Date, or (d) within five (5) Business Days prior to the applicable expiry date of the Letters of Credit (if such expiry date is within fifteen (15) Business Days of the Facility Termination Date), then the U.S. Borrower shall, at U.S. Issuing Bank's or the Agent's request, Cash Collateralize the stated amount of all outstanding Letters of Credit issued for the account of the U.S. Borrower and pay to U.S. Issuing Bank the amount of all other U.S. LC Obligations. The U.S. Borrower shall, **on demand** by U.S. Issuing Bank or the Agent from time to time, Cash Collateralize (in Dollars or, if the applicable Letters of Credit were issued in Canadian Dollars or an Alternative Currency and if so requested by the applicable U.S. Issuing Bank (in its sole discretion), Canadian Dollars or such Alternative Currency) the U.S. LC Obligations of any Defaulting Lender that is a U.S. Lender. If the U.S. Borrower fails to provide any Cash Collateral as required hereunder, the U.S. Lenders may (and shall upon direction of the Agent) advance, as U.S. Revolver Loans, the amount of the Cash Collateral required (whether or not the U.S. Revolver Commitments have terminated, any U.S. Overadvance exists or is created thereby or the conditions in **Section 6** are satisfied)."

(k) Section 2.2.4 of the Credit Agreement is hereby amended by deleting the "(" immediately before "the Person" appears therein.

(l) Section 2.3.1 of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof

the following:

"Issuance of Letters of Credit. Canadian Issuing Bank agrees to issue letters of credit and letters of guarantee for the account of the Canadian Borrower ("Canadian Letters of Credit") from time to time until (x) fifteen (15) Business Days prior to the Facility Termination Date (or until the Canadian Revolver Commitment Termination Date, if earlier) or (y) with the consent of the Agent and Canadian Issuing Bank, the Facility Termination Date (or until the Canadian Revolver Commitment Termination Date, if earlier), on the terms set forth herein, including the following:"

(m) Section 2.3.1(a) of the Credit Agreement is hereby amended by deleting the first sentence in such subsection in its entirety and inserting in lieu thereof the following:

“The Canadian Borrower acknowledges that Canadian Issuing Bank’s willingness to issue any Canadian Letter of Credit is conditioned upon Canadian Issuing Bank’s receipt of an LC Application with respect to the requested Canadian Letter of Credit, as well as such other instruments and agreements as Canadian Issuing Bank may customarily require for issuance of a letter of credit or letter of guarantee of similar type and amount.”

(n) Section 2.3.1(b) of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof the following:

“(b) Letters of Credit may be requested by the Loan Party Agent for the account of Canadian Borrower only (i) to support obligations of a Canadian Domiciled Loan Party incurred in the Ordinary Course of Business; or (ii) for other purposes as the Agent may approve from time to time in writing. The renewal or extension of any Canadian Letter of Credit shall be treated as the issuance of a new Canadian Letter of Credit, except that delivery of a new LC Application may be required at the discretion of Canadian Issuing Bank. Notwithstanding that a Canadian Letter of Credit issued or outstanding hereunder is in support of obligations of a Canadian Domiciled Loan Party incurred in the Ordinary Course of Business or for other purposes as the Agent may approve from time to time in writing, the Canadian Borrower shall be obligated to reimburse, indemnify and compensate the applicable Issuing Bank hereunder for any and all drawings under such Letter of Credit as if such Letter of Credit had been issued solely for the account of the Canadian Borrower. The Canadian Borrower irrevocably waives any and all defenses that might otherwise be available to it as a guarantor or surety of any or all of the obligations of any such Canadian Domiciled Loan Party or other Subsidiary in respect of such Letter of Credit. The Canadian Borrower hereby acknowledges that the issuance of Canadian Letters of Credit for the account of Canadian Domiciled Loan Parties or other Subsidiaries inures to the benefit of the Canadian Borrower, and that the Canadian Borrower’s business derives substantial benefits from the businesses of such Canadian Domiciled Loan Parties or other Subsidiaries.”

(o) Section 2.3.2(a) of the Credit Agreement is hereby amended by deleting the second sentence of such section in its entirety and inserting in lieu thereof the following:

“The obligation of the Canadian Borrower to reimburse Canadian Issuing Bank for any payment made under a Canadian Letter of Credit shall be absolute, unconditional and irrevocable, and shall be paid under any and all circumstances whatsoever without regard to any lack of validity or enforceability of any Canadian Letter of Credit, any adverse change in the relevant exchange rates or in the availability of any relevant Alternative Currency to the U.S. Borrower or in the relevant currency markets generally, the existence of any claim, setoff, defense or other right that the Canadian Borrower or any other Canadian Domiciled Loan Parties may have at any time against the beneficiary, or any other event or circumstance whatsoever, whether or not similar to any of the foregoing, that might, but for the provisions of this Section, constitute a legal or equitable discharge of, or provide a right of setoff against, the Canadian Borrower’s obligations hereunder.”

(p) Section 2.3.2(b) of the Credit Agreement is hereby amended by adding “in Dollars or Canadian Dollars, as the case may be,” immediately after “unconditionally pay” appears therein.

(q) Section 2.3.4 of the Credit Agreement is hereby amended by deleting the “(” immediately before “the Person” appears therein.

(r) Section 3.2.2 of the Credit Agreement is hereby amended by deleting the first sentence such section in its entirety and inserting in lieu thereof the following:

“The U.S. Borrower shall pay (a) to the Agent, for the Pro Rata benefit of the U.S. Lenders, a fee equal to the per annum rate of the Applicable Margin in effect for LIBOR Loans times the Dollar Equivalent of the average daily stated amount of U.S. Letters of Credit, which fee shall be payable monthly in arrears, on the first (1st) day of each month; (b) to U.S. Issuing Bank, for its own account, a fronting fee equal to .125% per annum on the Dollar Equivalent of the stated amount of each U.S. Letter of Credit issued by U.S. Issuing Bank, which fee shall be payable monthly in arrears, on the first (1st) day of each month; and (c) to U.S. Issuing Bank, for its own account, all customary charges associated with the issuance, amending, negotiating, payment, processing, transfer and administration of U.S. Letters of Credit, which charges shall be paid as and when incurred; provided that, for the avoidance of doubt, all amounts payable pursuant to this **clause (c)** with respect to the Existing Letters of Credit shall be determined in accordance with the applicable documentation thereto.”

(s) Section 3.2.3 of the Credit Agreement is hereby amended by deleting the first sentence such section in its entirety and inserting in lieu thereof the following:

“The Canadian Borrower shall pay (a) to the Agent, for the Pro Rata benefit of the Canadian Lenders, a fee equal to the per annum rate of the Applicable Margin in effect for Canadian BA Rate Loans times the Dollar Equivalent of the average daily stated amount of Canadian Letters of Credit, which fee shall be payable monthly in arrears, on the first (1st) day of each month; (b) to Canadian Issuing Bank, for its own account, a fronting fee equal to .125% per annum on the Dollar Equivalent of the stated amount of each Canadian Letter of Credit issued by Canadian Issuing Bank, which fee shall be payable monthly in arrears, on the first (1st) day of each month; and (c) to Canadian Issuing Bank, for its own account, all customary charges associated with the issuance, amending, negotiating, payment, processing, transfer and administration of Canadian Letters of Credit, which charges shall be paid as and when incurred; provided that, for the avoidance of doubt, all amounts payable pursuant to this **clause (c)** with respect to the Existing Letters of Credit shall be determined in accordance with the applicable documentation thereto.”

(t) Section 3.9 of the Credit Agreement is hereby amended by deleting such section in its entirety and inserting in lieu thereof the following:

“**3.9 Funding Losses.** If for any reason (other than default by a Lender) (a) any Borrowing of, or conversion to or continuation of, an Interest Period Loan does not occur on the date specified therefor in a Notice of Borrowing or Notice of Conversion/Continuation (whether or not withdrawn), (b) any repayment or conversion of an Interest Period Loan occurs on a day other than the end of its Interest Period, (c) any Borrower fails to repay an Interest Period Loan when required hereunder, or (d) any Borrower fails to repay any drawing under any Letter of Credit (or interest due thereon) denominated in an Alternative Currency on its scheduled due date or any payment thereof in a different currency, then such Borrower shall pay to the Agent its customary administrative charge and to each Lender and the applicable Issuing Bank all losses and expenses that it sustains as a consequence thereof, including any loss or expense arising from liquidation or redeployment of funds or from fees payable to terminate deposits of matching funds, but excluding loss of margin. All amounts payable by the Borrowers under this **Section 3.9** shall be due and payable in accordance with **Section 3.3**. The Lenders shall not be required to purchase Dollar deposits in the London interbank market or any other offshore Dollar market to fund any LIBOR Loan, but the provisions hereof shall apply as if each Lender had purchased such deposits.”

(u) Section 5.11.1 of the Credit Agreement is hereby amended by deleting such subsection in its entirety and inserting in lieu thereof the following:

“5.11.1 Except as otherwise explicitly set forth herein (including in **Section 2.2.2**), each repayment of a Revolver Loan or LC Obligation or a part thereof shall be made in the currency in which such Revolver Loan or LC Obligation is denominated at the time of that repayment;”

(v) Section 5.12 of the Credit Agreement is hereby amended by deleting such section in its entirety and inserting in lieu thereof the following:

“**5.12 Currency Fluctuations.** On each Business Day or such other date determined by the Agent, the Agent shall determine the Exchange Rate as of such date. The Exchange Rate so determined shall become effective on the first Business Day immediately following such determination (a “Reset Date”) and shall remain effective until the next succeeding Reset Date. On each Reset Date, the Agent shall determine the Dollar Equivalent of the Canadian Revolver Exposure and Dollar Equivalent of any U.S. LC Obligations arising under U.S. Letters of Credit issued in Canadian Dollars or an Alternative Currency. If, on any Reset Date, the Total Revolver Exposure exceeds the total amount of the Commitments on such date, the U.S. LC Obligations on such date exceed the U.S. Letter of Credit Sublimit, the U.S. Revolver Exposure on such date exceeds the U.S. Borrowing Base, or the Canadian LC Obligations on such date exceed the Canadian Letter of Credit Sublimit, the Canadian Revolver Exposure on such date exceeds the Canadian Borrowing Base on such date (the amount of any such excess referred to herein as the “Excess Amount”) then (a) the Agent shall give notice thereof to the Borrowers and the Lenders and (b) within two (2) Business Days thereafter, the Borrowers shall cause such excess to be eliminated, either by repayment of Revolver Loans or depositing of Cash Collateral with the Agent with respect to LC Obligations and, until such Excess Amount is repaid, the Lenders shall not have any obligation to make any Loans.”

(w) The Credit Agreement is hereby amended by adding the following new Section 14.24 in the appropriate numerical order:

“14.2.4 Acknowledgment Regarding Any Support QFCs. To the extent that the Loan Documents provide support, through a guarantee or otherwise, for any Hedging Agreement or any other agreement or instrument that is a QFC (such support, “QFC Credit Support”, and each such QFC, a “Supported QFC”), the parties acknowledge and agree as follows with respect to the resolution power of the Federal Deposit Insurance Corporation under the Federal Deposit Insurance Act and Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act (together with the regulations promulgated thereunder, the “U.S. Special Resolution Regimes”) in respect of such Supported QFC and QFC Credit Support (with the provisions below applicable notwithstanding that the Loan Documents and any Supported QFC may in fact be stated to be governed by the laws of the State of New York and/or of the United States or any other state of the United States): In the event a Covered Entity that is party to a Supported QFC (each, a “Covered Party”) becomes subject to a proceeding under a U.S. Special Resolution Regime, the transfer of such Supported QFC and the benefit of such QFC Credit Support (and any interest and obligation in or under such Supported QFC and such QFC Credit Support, and any rights in property securing such Supported QFC or such QFC Credit Support) from such Covered Party will be effective to the same extent as the transfer would be effective under the U.S. Special Resolution Regime if the Supported QFC and such QFC Credit Support (and any such interest, obligation and rights in property) were governed by the laws of the United States or a state of the United States. In the event a Covered Party or a BHC Act Affiliate of a Covered Party becomes subject to a proceeding under a U.S. Special Resolution Regime, Default Rights under the Loan Documents that might otherwise apply to such Supported QFC or any QFC Credit Support that may be exercised against such Covered Party are permitted to be exercised to no greater extent than such Default Rights could be exercised under the U.S. Special Resolution Regime if the Supported QFC and the Loan Documents were governed by the laws of the United States or a state of the United States. Without limitation of the foregoing, it is understood and agreed that rights and remedies of the parties with respect to a Defaulting Lender shall in no event affect the rights of any Covered Party with respect to a Supported QFC or any QFC Credit Support.

For purposes hereof, the following terms shall have the following meanings:

“BHC Act Affiliate” of a party means an “affiliate” (as such term is defined under, and interpreted in accordance with, 12 U.S.C. 1841(k)) of such party.

“Covered Entity” means any of the following: (a) a “covered entity” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 252.82(b); (b) a “covered bank” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 47.3(b); or (c) a “covered FSI” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 382.2(b).

“Default Right” has the meaning assigned to that term in, and shall be interpreted in accordance with, 12 C.F.R. §§ 252.81, 47.2 or 382.1, as applicable.

“QFC” has the meaning assigned to the term “qualified financial contract” in, and shall be interpreted in accordance with, 12 U.S.C. 5390(c)(8)(D).”

3. Representations and Warranties. Each Loan Party hereby represents and warrants that:

(a) no Default or Event of Default has occurred and is continuing;

(b) the execution, delivery and performance of this Fourth Amendment by each Loan Party are all within such Loan Party’s corporate powers, are not in contravention of any Applicable Law or the terms of such Loan Party’s Organic Documents, the Goldman Term Loan Agreement, or any indenture, agreement or undertaking to which such Loan Party is a party or by which such Loan Party or its property is bound, and shall not result in the creation or imposition of any lien, claim, charge or encumbrance upon any of the Collateral, except in favor of Agent and the other Secured Parties pursuant to the Credit Agreement and the other Loan Documents as amended hereby;

(c) this Fourth Amendment and each other agreement or instrument to be executed and delivered by the Loan Parties in connection herewith have been duly authorized, executed and delivered by all necessary action on the part of such Loan Party and, if necessary, its stockholders, as the case may be, and the agreements and obligations of each Loan Party contained herein and therein constitute the legal, valid and binding obligations of such Loan Party, enforceable against it in accordance with their terms, except as enforceability is limited by bankruptcy, insolvency, reorganization, receivership, moratorium or other laws affecting creditor’s rights generally and by general principles of equity; and

(d) after giving effect to this Fourth Amendment, all representations and warranties contained in the Credit Agreement and each other Loan Document are true and correct in all respects on and as of the date hereof, except to the extent that such representations and warranties specifically refer to an earlier date, in which case they shall be true and correct as of such earlier date, and except for the representations and warranties contained in Sections 9.1.5(a) and (b) of the Credit Agreement, which shall be deemed to refer to the most recent statements furnished pursuant to Sections 10.1.1(a) and (b) of the Credit Agreement, respectively.

4. Conditions to Effectiveness. This Fourth Amendment shall not be effective until each of the following conditions precedent have been fulfilled to the satisfaction of the Agent (such date referred to herein as, the "Effective Date"):

- (a) the Issuing Banks and Required Lenders shall have approved this Fourth Amendment;
- (b) the Agent shall have received this Fourth Amendment, duly executed by each of the parties hereto;
- (c) after giving effect to this Fourth Amendment, no Default or Event of Default shall have occurred and be continuing;

(d) all orders, permissions, consents, approvals, licenses, authorizations and validations of, and filings, recordings and registrations with, and exemptions by, any Governmental Authority, or any other Person required to authorize or otherwise required in connection with the execution, delivery and performance by each Loan Party of this Fourth Amendment and the transactions contemplated, shall have been obtained and shall be in full force and effect; and

(e) the Borrowers shall have paid in full all fees and expenses of the Agent (including the fees, charges and disbursement of counsel to the Agent) incurred in connection with the preparation, execution, delivery and administration of this Fourth Amendment and the other instruments and documents to be delivered hereunder (with such fees and expenses described in this paragraph being fully earned as of the date hereof, and no portion thereof shall be refunded or returned to the Loan Parties under any circumstances).

5. Effect on Loan Documents. The Credit Agreement and the other Loan Documents, after giving effect to the Fourth Amendment and any other Loan Documents to be executed simultaneously herewith, shall be and remain in full force and effect in accordance with their terms and hereby are ratified and confirmed in all respects. The execution, delivery, and performance of this Fourth Amendment shall not operate as a waiver of any right, power, or remedy of the Agent or any other Secured Party under the Credit Agreement or any other Loan Document, as in effect prior to the date hereof. Each Loan Party hereby ratifies and confirms in all respects all of its obligations (including with respect to Guarantees) and liabilities under the Loan Documents to which it is a party and each Loan Party hereby ratifies and confirms in all respects any prior grant of a security interest under the Loan Documents to which it is party, which security interests shall continue to secure the applicable Obligations (after giving effect to this Fourth Amendment), in each case, on and subject to the terms and conditions set forth in the Credit Agreement and the other Loan Documents.

6. Further Assurances. Each Loan Party shall execute and deliver all agreements, documents and instruments, each in form and substance satisfactory to the Agent, and take all actions as the Agent may reasonably request from time to time, to perfect and maintain the perfection and priority of the security interest in the Collateral held by the Agent and to fully consummate the transactions contemplated under this Fourth Amendment, the Credit Agreement, and the other Loan Documents, as modified hereby or simultaneously herewith, as applicable.

7. Release. Each Loan Party hereby remises, releases, acquits, satisfies and forever discharges Agent and the other Secured Parties, their agents, employees, officers, directors, predecessors, attorneys and all others acting on behalf of or at the direction of Agent or the other Secured Parties, of and from any and all manner of actions, causes of action, suit, debts, accounts, covenants, contracts, controversies, agreements, variances, damages, judgments, claims and demands whatsoever, in law or in equity, which any of such parties ever had, or now has, to the extent arising from or in connection with any act, omission or state of facts taken or existing on or prior to the Effective Date, against Agent and the other Secured Parties, their agents, employees, officers, directors, attorneys and all persons acting on behalf of or at the direction of Agent or the other Secured Parties ("Releasees"), for, upon or by reason of any matter, cause or thing whatsoever arising under, or in connection with, or otherwise related to, the Loan Documents through the Effective Date. Without limiting the generality of the foregoing, each Loan Party waives and affirmatively agrees not to allege or otherwise pursue any defenses, affirmative defenses, counterclaims, claims, causes of action, setoffs or other rights they have or may have under, or in connection with, or otherwise related to, the Loan Documents as of the Effective Date, including, but not limited to, the rights to contest any conduct of Agent, the other Secured Parties or other Releasees on or prior to the Effective Date.

8. No Novation; Entire Agreement. This Fourth Amendment evidences solely the amendment of certain specified terms and obligations of the Loan Parties under the Credit Agreement and is not a novation or discharge of any of the other

obligations of the Loan Parties under the Credit Agreement. There are no other understandings, express or implied, among the Loan Parties, the Agent and the other Secured Parties regarding the subject matter hereof or thereof.

9. Choice of Law. THIS FOURTH AMENDMENT SHALL BE GOVERNED BY THE LAWS OF THE STATE OF NEW YORK, WITHOUT GIVING EFFECT TO ANY CONFLICT OF LAW PRINCIPLES (BUT GIVING EFFECT TO SECTION 5-1401 OF THE NEW YORK GENERAL OBLIGATION LAW AND FEDERAL LAWS RELATING TO NATIONAL BANKS).

10. Counterparts; Facsimile Execution. This Fourth Amendment may be executed in any number of counterparts and by different parties and on separate counterparts, each of which when so executed and delivered shall be deemed an original, and all of which, when taken together, shall constitute one and the same instrument. Delivery of an executed counterpart of a signature page to this Fourth Amendment by facsimile (or other electronic transmission) shall be as effective as delivery of a manually executed counterpart of this Fourth Amendment.

11. Construction. This Fourth Amendment is a Loan Document. This Fourth Amendment and the Credit Agreement shall be construed collectively and in the event that any term, provision or condition of any of such documents is inconsistent with or contradictory to any term, provision or condition of any other such document, the terms, provisions and conditions of this Fourth Amendment shall supersede and control the terms, provisions and conditions of the Credit Agreement.

12. Miscellaneous. The terms and provisions hereof shall be binding upon and inure to the benefit of the parties hereto and their successors and assigns.

[Signature Pages Follow]

IN WITNESS WHEREOF, this Fourth Amendment has been duly executed and delivered by each of the parties hereto as a sealed instrument as of the date first above written.

BORROWERS:

CLEAN HARBORS, INC.

By: /s/ Michael L. Battles
Name: Michael L. Battles
Title: Chief Financial Officer and Executive Vice President

CLEAN HARBORS INDUSTRIAL SERVICES CANADA, INC.

By: /s/ Michael L. Battles
Name: Michael L. Battles
Title: Executive Vice President

OTHER LOAN PARTIES:

ALTAIR DISPOSAL SERVICES, LLC
BATON ROUGE DISPOSAL, LLC
BRIDGEPORT DISPOSAL, LLC
CH INTERNATIONAL HOLDINGS, LLC
CLEAN HARBORS ANDOVER, LLC
CLEAN HARBORS ARAGONITE, LLC
CLEAN HARBORS ARIZONA, LLC
CLEAN HARBORS BATON ROUGE, LLC
CLEAN HARBORS BDT, LLC
CLEAN HARBORS BUTTONWILLOW, LLC
CLEAN HARBORS CHATTANOOGA, LLC
CLEAN HARBORS CLIVE, LLC
CLEAN HARBORS COFFEYVILLE, LLC
CLEAN HARBORS COLFAX, LLC
CLEAN HARBORS DEER PARK, LLC
CLEAN HARBORS DEER TRAIL, LLC
CLEAN HARBORS DEVELOPMENT, LLC
CLEAN HARBORS DISPOSAL SERVICES, INC.
CLEAN HARBORS EL DORADO, LLC
CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
CLEAN HARBORS EXPLORATION SERVICES, INC.
CLEAN HARBORS FLORIDA, LLC
CLEAN HARBORS GRASSY MOUNTAIN, LLC
CLEAN HARBORS INDUSTRIAL SERVICES, INC.
CLEAN HARBORS KANSAS, LLC
CLEAN HARBORS KINGSTON FACILITY CORPORATION
CLEAN HARBORS LAPORTE, LLC
CLEAN HARBORS LAUREL, LLC
CLEAN HARBORS LONE MOUNTAIN, LLC
CLEAN HARBORS OF BALTIMORE, INC.
CLEAN HARBORS OF BRAINTREE, INC.
CLEAN HARBORS OF CONNECTICUT, INC.
CLEAN HARBORS PECATONICA, LLC
CLEAN HARBORS RECYCLING SERVICES OF CHICAGO, LLC
CLEAN HARBORS RECYCLING SERVICES OF OHIO, LLC
CLEAN HARBORS REIDSVILLE, LLC
CLEAN HARBORS SAN JOSE, LLC
CLEAN HARBORS SAN LEON, INC.
CLEAN HARBORS SERVICES, INC.
CLEAN HARBORS SURFACE RENTALS USA, INC.
CLEAN HARBORS TENNESSEE, LLC
CLEAN HARBORS WESTMORLAND, LLC
CLEAN HARBORS WHITE CASTLE, LLC
CLEAN HARBORS WICHITA, LLC
CLEAN HARBORS WILMINGTON, LLC
CROWLEY DISPOSAL, LLC
DISPOSAL PROPERTIES, LLC
EMERALD SERVICES, INC.
GSX DISPOSAL, LLC
HILLIARD DISPOSAL, LLC
INDUSTRIAL SERVICE OIL COMPANY, INC.
MURPHY'S WASTE OIL SERVICE INC.
ROEBUCK DISPOSAL, LLC
ROSEMEAD OIL PRODUCTS, INC.
SAFETY-KLEEN ENVIROSYSTEMS COMPANY
SAFETY-KLEEN ENVIROSYSTEMS COMPANY OF PUERTO RICO, INC.
SAFETY-KLEEN, INC.

**SAFETY-KLEEN INTERNATIONAL, INC.
SAFETY-KLEEN SYSTEMS, INC.
SAFETY-KLEEN OF CALIFORNIA, INC.
SAWYER DISPOSAL SERVICES, LLC
SERVICE CHEMICAL, LLC
SPRING GROVE RESOURCE RECOVERY, INC.
THERMO FLUIDS INC.
THE SOLVENTS RECOVERY SERVICE OF NEW JERSEY, INC.
TULSA DISPOSAL, LLC
VERSANT ENERGY SERVICES, INC.
LONESTAR WEST ENTERPRISES, LLC
LONESTAR WEST SERVICES LLC
CYN OIL CORPORATION
H2O ENVIRONMENTAL, INC.**

By: /s/ Michael L. Battles

Name: Michael L. Battles
Title: Executive Vice President

PLAQUEMINE REMEDIATION SERVICES, LLC

By: /s/ Michael R. McDonald

Name: Michael R. McDonald

Title: President

BCT STRUCTURES, ULC
CLEAN HARBORS CANADA, INC.
CLEAN HARBORS DIRECTIONAL BORING SERVICES, ULC
CLEAN HARBORS ENERGY AND INDUSTRIAL SERVICES CORP.
CLEAN HARBORS ENERGY AND INDUSTRIAL WESTERN LTD.
CLEAN HARBORS ENERGY SERVICES, ULC
CLEAN HARBORS EXPLORATION SERVICES, ULC
CLEAN HARBORS INDUSTRIAL SERVICES CANADA, INC.
CLEAN HARBORS INNU ENVIRONMENTAL SERVICES, INC.
CLEAN HARBORS LODGING SERVICES, ULC
SERVICES ENVIRONNEMENTAUX CLEAN HARBORS MERCIER, INC./CLEAN HARBORS
MERCIER, INC.
CLEAN HARBORS PRODUCTION SERVICES, ULC
SERVICES ENVIRONNEMENTAUX CLEAN HARBORS QUEBEC, INC./CLEAN HARBORS
QUEBEC, INC.
CLEAN HARBORS SURFACE RENTALS, ULC
ENVIROSORT INC.
GRIZZCO CAMP SERVICES, ULC
JL FILTRATION INC.
LONESTAR WEST INC.
LONESTAR SYLVAN INC.
LONESTAR VACUUM INC.
SAFETY-KLEEN CANADA INC.
SANITHERM, ULC
TRI-VAX ENTERPRISES LTD.
VULSAY INDUSTRIES LTD.

By: /s/ Michael L. Battles

Name: Michael L. Battles

Title: Executive Vice President

CLEAN HARBORS DIRECTIONAL BORING SERVICES LP

Clean Harbors Directional Boring Services, ULC,
Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

CLEAN HARBORS ENERGY AND INDUSTRIAL SERVICES LP

Clean Harbors Energy and Industrial Services Corp.,
Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

CLEAN HARBORS EXPLORATION SERVICES LP

Clean Harbors Exploration Services ULC,
Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

CLEAN HARBORS LODGING SERVICES LP

Clean Harbors Lodging Services, ULC,
Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

CLEAN HARBORS SURFACE RENTALS PARTNERSHIP

Clean Harbors Surface Rentals, ULC,
Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

JL FILTRATION OPERATING LIMITED PARTNERSHIP

JL Filtration Inc., Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

VERSANT ENERGY SERVICES, LP

Clean Harbors Industrial Services Canada, Inc.,
Its General Partner

By: /s/ Michael L. Battles
Michael L. Battles, Executive Vice President

AGENT AND LENDERS:

BANK OF AMERICA, N.A.,
as Agent, a U.S. Issuing Bank, and a U.S. Lender

By: /s/ Christopher M. O'Halloran
Name: Christopher M. O'Halloran
Title: Senior Vice President

BANK OF AMERICA, N.A. (acting through its Canada branch), as a Canadian Lender and Canadian Issuing Bank

By: /s/ Sylwia Durkiewicz
Name: Sylwia Durkiewicz
Title: Vice President

CANADIAN IMPERIAL BANK OF COMMERCE,
as a Canadian Lender

By: /s/ Aaron Adinata
Name: Aaron Adinata
Title: Authorized Signatory

By: /s/ Brian Chisholm
Name: Brian Chisholm
Title: Authorized Signatory

CANADIAN IMPERIAL BANK OF COMMERCE, NEW YORK BRANCH, as a U.S. Lender

By: /s/ Andrew R. Campbell

Name: Andrew R. Campbell

Title: Authorized Signatory

By: /s/ Dominic Sorresso

Name: Dominic Sorresso

Title: Authorized Signatory

CITIZENS BUSINESS CAPITAL, f/k/a RBS CITIZENS BUSINESS CAPITAL, a division of CITIZENS ASSET FINANCE, INC., f/k/a RBS ASSET FINANCE, INC., as a U.S. Lender and Canadian Lender

By: /s/ William Boyle

Name: William Boyle

Title: AVP

JPMORGAN CHASE BANK, N.A., as a U.S. Lender and U.S. Issuing Bank

By: /s/ Alicia Schreiber

Name: Alicia Schreiber

Title: Executive Director

JPMORGAN CHASE BANK, N.A., Toronto Branch, as a Canadian Lender and Canadian Issuing Bank

By: /s/ Deborah Booth

Name: Deborah Booth

Title: Executive Director

PEOPLE'S UNITED BANK, N.A., as a U.S. Lender and Canadian Lender

By: /s/ Michael J. McDermott

Name: Michael J. McDermott

Title: SVP

SIEMENS FINANCIAL SERVICES, INC., as a U.S. Lender and Canadian Lender

By: /s/ Mark Schafer

Name: Mark Schafer

Title: Vice President

By: /s/ Maria Levy

Name: Maria Levy

Title: Vice President

GOLDMAN SACHS BANK USA, as a U.S. Lender and Canadian Lender

By: /s/ Jamie Minieri
Name: Jamie Minieri
Title: Authorized Signatory

Subsidiaries of Clean Harbors, Inc.

Subsidiary	Jurisdiction of Organization
Altair Disposal Services, LLC	Delaware
Baton Rouge Disposal, LLC	Delaware
Bridgeport Disposal, LLC	Delaware
Cat Tech International, Ltd.*	Bahamas
CH International Holdings, LLC	Delaware
Clean Harbors Andover, LLC	Delaware
Clean Harbors Aragonite, LLC	Delaware
Clean Harbors Arizona, LLC	Delaware
Clean Harbors Baton Rouge, LLC	Delaware
Clean Harbors BDT, LLC	Delaware
Clean Harbors Buttonwillow, LLC	Delaware
Clean Harbors Canada, Inc.*	New Brunswick
Clean Harbors Caribe, Inc.*	Puerto Rico
Clean Harbors Chattanooga, LLC	Delaware
Clean Harbors Clive, LLC	Delaware
Clean Harbors Coffeyville, LLC	Delaware
Clean Harbors Colfax, LLC	Delaware
Clean Harbors Deer Park, LLC	Delaware
Clean Harbors Deer Trail, LLC	Delaware
Clean Harbors Development, LLC	Delaware
Clean Harbors Directional Boring Services, ULC*	Alberta
Clean Harbors Directional Boring Services LP*	Alberta
Clean Harbors Disposal Services, Inc.	Delaware
Clean Harbors El Dorado, LLC	Delaware
Clean Harbors Energy and Industrial Services Corp.*	Alberta
Clean Harbors Energy and Industrial Services LP*	Alberta
Clean Harbors Energy and Industrial Western Ltd.*	Alberta
Clean Harbors Energy Services ULC*	Alberta
Clean Harbors Environmental Services, Inc.	Massachusetts
Clean Harbors Exploration Services, Inc.	Nevada
Clean Harbors Exploration Services, ULC*	Alberta
Clean Harbors Exploration Services LP*	Alberta
Clean Harbors Florida, LLC	Delaware
Clean Harbors Grassy Mountain, LLC	Delaware
Clean Harbors India LLP*	India
Clean Harbors Industrial Services Canada, Inc.*	Alberta
Clean Harbors Industrial Services, Inc.	Delaware
Clean Harbors Innu Environmental Services, Inc.	Newfoundland
Clean Harbors Kansas, LLC	Delaware
Clean Harbors Kingston Facility Corporation	Massachusetts
Clean Harbors LaPorte, LLC	Delaware

Clean Harbors Laurel, LLC	Delaware
Clean Harbors Lodging Services LP*	Alberta
Clean Harbors Lodging Services, ULC*	Alberta
Clean Harbors Lone Mountain, LLC	Delaware
Clean Harbors Mercier, Inc.	Quebec
Clean Harbors of Baltimore, Inc.	Delaware
Clean Harbors of Braintree, Inc.	Massachusetts
Clean Harbors of Connecticut, Inc.	Delaware
Clean Harbors Pecatonica, LLC	Delaware
Clean Harbors Production Services, ULC*	Alberta
Clean Harbors Quebec, Inc.*	Quebec
Clean Harbors Recycling Services of Chicago, LLC	Delaware
Clean Harbors Recycling Services of Ohio LLC	Delaware
Clean Harbors Reidsville, LLC	Delaware
Clean Harbors San Jose, LLC	Delaware
Clean Harbors San Leon, Inc.	Delaware
Clean Harbors Services, Inc.	Massachusetts
Clean Harbors Surface Rentals, ULC*	Alberta
Clean Harbors Surface Rentals Partnership*	Alberta
Clean Harbors Surface Rentals USA, Inc.	Delaware
Clean Harbors Tennessee, LLC	Delaware
Clean Harbors Westmorland, LLC	Delaware
Clean Harbors White Castle, LLC	Delaware
Clean Harbors Wichita, LLC	Delaware
Clean Harbors Wilmington, LLC	Delaware
Crowley Disposal, LLC	Delaware
CTVI Inc.*	Virgin Islands
Cyn Oil Corporation	Massachusetts
Disposal Properties, LLC	Delaware
Emerald Services, Inc.	Washington
EnviroSORT Inc.	Alberta
Grizzco Camp Services, ULC*	British Columbia
GSX Disposal, LLC	Delaware
H2O Environmental, Inc.	Nevada
Hilliard Disposal, LLC	Delaware
Industrial Service Oil Company, Inc.	California
Laidlaw Environmental Services de Mexico S.A. de C.V.*	Mexico
Lonestar Sylvan Inc.*	Canada
Lonestar Vacuum Inc.*	Alberta
Lonestar West Enterprises LLC	Oklahoma
Lonestar West Inc.*	Canada
Lonestar West Services LLC	Nevada
Murphy's Waste Oil Service, Inc.	Massachusetts

Northeast Casualty Insurance Company	Vermont
Plaquemine Remediation Services, LLC	Delaware
Rosemead Oil Products, Inc.	California
Roebuck Disposal, LLC	Delaware
Safety-Kleen de Mexico, S. de R.L. de C.V.*	Mexico
Safety-Kleen Canada Inc.*	New Brunswick
Safety-Kleen EnviroSystems Company	California
Safety-Kleen EnviroSystems Company of Puerto Rico, Inc.	Indiana
Safety-Kleen, Inc.	Delaware
Safety-Kleen International, Inc.	Delaware
Safety-Kleen International Asia Investment Company Limited*	Hong Kong
Safety-Kleen of California, Inc.	California
Safety-Kleen Systems, Inc.	Wisconsin
Sanitherm, ULC*	Alberta
Sawyer Disposal Services, LLC	Delaware
Service Chemical, LLC	Delaware
SK D'Incineration*	Quebec
SK Servicios Ambientales Administrativos, S. de R.L. de C.V.*	Mexico
Spring Grove Resource Recovery, Inc.	Delaware
The Solvents Recovery Service of New Jersey, Inc.	New Jersey
Thermo Fluids Inc.	Delaware
Tri-vax Enterprises Ltd.*	Alberta
Tulsa Disposal, LLC	Delaware
Veolia ES Industrial Services, Inc.	Delaware
Versant Energy Services, Inc.	Delaware
Versant Energy Services, LP*	Alberta
Vulsay Industries Ltd.*	Ontario

*Foreign entity or subsidiary of foreign entity

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement No. 333-166963 on Form S-8 of our reports dated February 26, 2020, relating to the financial statements of Clean Harbors, Inc. and the effectiveness of Clean Harbors, Inc.'s internal control over financial reporting appearing in this Annual Report on Form 10-K for the year ended December 31, 2019.

/s/ Deloitte & Touche LLP

Boston, Massachusetts
February 26, 2020

POWER OF ATTORNEY

Know all by these presents, that the undersigned hereby constitutes and appoints each of Alan S. McKim and Michael L. Battles, signing singly, the undersigned's true and lawful attorney-in-fact to:

- (1) execute for and on behalf of the undersigned, in the undersigned's capacity as an officer and/or director of Clean Harbors, Inc. (the "Company"), any and all documents required by the Securities and Exchange Commission pursuant to the Securities Exchange Act of 1934 and the rules thereunder, including, without limitation, Form 10-K;
- (2) do and perform any and all acts for and on behalf of the undersigned which may be necessary or desirable to complete and execute any such document filing and timely file such form with the United States Securities and Exchange Commission and any stock exchange or similar authority; and
- (3) take any other action of any type whatsoever in connection with the foregoing which, in the opinion of such attorney-in-fact, may be of benefit to, and in the best interest of, or legally required by, the undersigned.

The undersigned hereby grants to each such attorney-in-fact full power and authority to do and perform any and every act and thing whatsoever requisite, necessary, or proper to be done in the exercise of any of the rights and powers herein granted, as fully to all intents and purposes as the undersigned might or could do if personally present, with full power of substitution or revocation, hereby ratifying and confirming all that such attorney-in-fact, or such attorney-in-fact's substitute or substitutes, shall lawfully do or cause to be done by virtue of this power of attorney and the rights and powers herein granted. The undersigned acknowledges that the foregoing attorneys-in-fact, in serving in such capacity at the request of the undersigned, are not assuming, nor is the Company assuming, any of the undersigned's responsibilities to comply with Section 16 of the Securities Exchange Act of 1934.

This Power of Attorney shall remain in full force and effect until the undersigned is no longer required with respect to the undersigned's capacity as an officer and/or director and/or holdings of and transactions in securities issued by the Company, unless earlier revoked by the undersigned in a signed writing delivered to the foregoing attorneys-in-fact.

IN WITNESS WHEREOF, the undersigned has caused this Power of Attorney to be executed as of this 26th day of February, 2020.

Signature

/s/ GENE BANUCCI

/s/ EDWARD G. GALANTE

/s/ ROD MARLIN

/s/ JOHN T. PRESTON

/s/ ANDREA ROBERTSON

/s/ THOMAS J. SHIELDS

/s/ LAUREN C. STATES

/s/ JOHN R. WELCH

/s/ ROBERT WILLETT

CERTIFICATION OF CHIEF EXECUTIVE OFFICER

I, Alan S. McKim, certify that:

1. I have reviewed this annual report on Form 10-K for the period ended December 31, 2019 of Clean Harbors, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Alan S. McKim

Alan S. McKim

Chairman, President and Chief Executive Officer

Date: February 26, 2020

CERTIFICATION OF CHIEF FINANCIAL OFFICER

I, Michael L. Battles, certify that:

1. I have reviewed this annual report on Form 10-K for the period ended December 31, 2019 of Clean Harbors, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Michael L. Battles

Michael L. Battles

Executive Vice President and Chief Financial Officer

Date: February 26, 2020

