

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

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2018

or

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

For the transition period from to

Commission File no. 1-7615

Kirby Corporation

(Exact name of registrant as specified in its charter)

Nevada
(State or other jurisdiction of incorporation or organization)
55 Waugh Drive, Suite 1000
Houston, Texas
(Address of principal executive offices)

74-1884980
(I.R.S. Employer Identification No.)
77007
(Zip Code)

Registrant's telephone number, including area code:
(713) 435-1000

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

Title of Each Class

Common Stock — \$.10 Par Value Per Share

Name of Each Exchange on Which Registered

New York Stock Exchange

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

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

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 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 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate website, if any, every Interactive Data File required to be submitted and posted 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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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

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

The aggregate market value of common stock held by nonaffiliates of the registrant as of June 30, 2018, based on the closing sales price of such stock on the New York Stock Exchange on June 30, 2018, was \$4,907,213,000. For purposes of this computation, all executive officers, directors and 10% beneficial owners of the registrant are deemed to be affiliates. Such determination should not be deemed an admission that such executive officers, directors and 10% beneficial owners are affiliates.

As of February 22, 2019, 59,875,000 shares of common stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Company's definitive proxy statement in connection with the Annual Meeting of Stockholders to be held April 30, 2019, to be filed with the Commission pursuant to Regulation 14A, are incorporated by reference into Part III of this report.

KIRBY CORPORATION
2018 FORM 10-K
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PART I

Item 1. *Business*

THE COMPANY

Kirby Corporation (the “Company”) is the nation’s largest domestic tank barge operator, transporting bulk liquid products throughout the Mississippi River System, on the Gulf Intracoastal Waterway, coastwise along all three United States coasts, and in Alaska and Hawaii. The Company transports petrochemicals, black oil, refined petroleum products and agricultural chemicals by tank barge. The Company also operates four offshore dry-bulk cargo barges, four offshore tugboats and one docking tugboat transporting dry-bulk commodities in the United States coastal trade. Through its distribution and services segment, the Company provides after-market service and parts for engines, transmissions, reduction gears, and related equipment used in oilfield services, marine, mining, power generation, on-highway and other industrial applications. The Company also rents equipment including generators, fork lifts, pumps and compressors for use in a variety of industrial markets, and manufactures and remanufactures oilfield service equipment, including pressure pumping units, for the oilfield service and oil and gas operator and producer markets.

Unless the context otherwise requires, all references herein to the Company include the Company and its subsidiaries.

The Company’s principal executive office is located at 55 Waugh Drive, Suite 1000, Houston, Texas 77007, and its telephone number is (713) 435-1000. The Company’s mailing address is P.O. Box 1745, Houston, Texas 77251-1745.

Documents and Information Available on Website

The Internet address of the Company’s website is <http://www.kirbycorp.com>. The Company makes available free of charge through its website, all of its filings with the Securities and Exchange Commission (“SEC”), including its annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, as soon as reasonably practicable after they are electronically filed with or furnished to the SEC.

The following documents are available on the Company’s website in the Investor Relations section under Corporate Governance:

- Audit Committee Charter
- Compensation Committee Charter
- Governance Committee Charter
- Business Ethics Guidelines
- Corporate Governance Guidelines

The Company is required to make prompt disclosure of any amendment to or waiver of any provision of its Business Ethics Guidelines that applies to any director or executive officer or to its chief executive officer, chief financial officer, chief accounting officer or controller or persons performing similar functions. The Company will make any such disclosure that may be necessary by posting the disclosure on its website in the Investor Relations section under Corporate Governance.

BUSINESS AND PROPERTY

The Company, through its subsidiaries, conducts operations in two business segments: marine transportation and distribution and services.

The Company, through its marine transportation segment, is a provider of marine transportation services, operating tank barges and towing vessels transporting bulk liquid products throughout the Mississippi River System, on the Gulf Intracoastal Waterway, coastwise along all three United States coasts, and in Alaska and Hawaii. The Company transports petrochemicals, black oil, refined petroleum products and agricultural chemicals by tank barge. The Company operates offshore dry-bulk barge and tugboat units engaged in the offshore transportation of dry-bulk cargoes in the United States coastal trade. The segment is a provider of transportation services for its customers and, in almost all cases, does not assume ownership of the products that it transports. All of the Company's vessels operate under the United States flag and are qualified for domestic trade under the Jones Act.

The Company, through its distribution and services segment, sells genuine replacement parts, provides service mechanics to overhaul and repair engines, transmissions, reduction gears and related oilfield services equipment, rebuilds component parts or entire diesel engines, transmissions and reduction gears, and related equipment used in oilfield services, marine, mining, power generation, on-highway and other industrial applications. The Company also rents equipment including generators, fork lifts, pumps and compressors for use in a variety of industrial markets, and manufactures and remanufactures oilfield service equipment, including pressure pumping units, for the oilfield service and oil and gas operator and producer markets.

The Company and its marine transportation and distribution and services segments have approximately 5,650 employees, the large majority of whom are in the United States.

The following table sets forth by segment the revenues, operating profits and identifiable assets attributable to the principal activities of the Company for the years indicated (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Revenues from unaffiliated customers:			
Marine transportation	\$ 1,483,143	\$ 1,324,106	\$ 1,471,893
Distribution and services	1,487,554	890,312	298,780
Consolidated revenues	<u>\$ 2,970,697</u>	<u>\$ 2,214,418</u>	<u>\$ 1,770,673</u>
Operating profits:			
Marine transportation	\$ 147,416	\$ 135,547	\$ 259,453
Distribution and services	129,305	86,479	3,068
General corporate expenses	(35,590)	(18,202)	(15,024)
Impairment of long-lived assets	(82,705)	(105,712)	—
Impairment of goodwill	(2,702)	—	—
Lease cancellation costs	(2,403)	—	—
Gain (loss) on disposition of assets	1,968	(4,487)	(127)
	<u>155,289</u>	<u>93,625</u>	<u>247,370</u>
Equity in earnings of affiliates	355	291	532
Other income (expense)	5,371	570	(2,466)
Interest expense	(46,856)	(21,472)	(17,690)
Earnings before taxes on income	<u>\$ 114,159</u>	<u>\$ 73,014</u>	<u>\$ 227,746</u>
Identifiable assets:			
Marine transportation	\$ 4,145,294	\$ 3,485,099	\$ 3,613,951
Distribution and services	1,653,636	1,567,085	623,268
	<u>5,798,930</u>	<u>5,052,184</u>	<u>4,237,219</u>
Investment in affiliates	2,495	1,890	2,622
General corporate assets	70,169	73,353	50,054
Consolidated assets	<u>\$ 5,871,594</u>	<u>\$ 5,127,427</u>	<u>\$ 4,289,895</u>

MARINE TRANSPORTATION

The marine transportation segment is primarily a provider of transportation services by tank barge for the inland and coastal markets. As of February 22, 2019, the equipment owned or operated by the marine transportation segment consisted of 1,003 inland tank barges with 21.8 million barrels of capacity, 285 inland towboats, 53 coastal tank barges with 5.1 million barrels of capacity, 50 coastal tugboats, four offshore dry-bulk cargo barges, four offshore tugboats and one docking tugboat with the following specifications and capacities:

Class of equipment	Number in class	Average age (in years)	Barrel capacities	Deadweight Tonnage
Inland tank barges (owned and leased):				
Regular double hull:				
20,000 barrels and under	369	12.1	4,304,000	
Over 20,000 barrels	581	12.0	16,649,000	
Specialty double hull	53	37.9	871,000	
Total inland tank barges	<u>1,003</u>	<u>13.4</u>	<u>21,824,000</u>	
Inland towboats (owned and chartered):				
800 to 1300 horsepower	54	39.2		
1400 to 1900 horsepower	64	30.8		
2000 to 2400 horsepower	137	11.5		
2500 to 3200 horsepower	12	22.4		
3300 to 4800 horsepower	14	31.0		
Greater than 5000 horsepower	4	39.8		
Total inland towboats	<u>285</u>	<u>22.9</u>		
Coastal tank barges (owned and leased):				
Double hull:				
30,000 barrels and under	3	20.2	65,000	
50,000 to 70,000 barrels	10	14.7	502,000	
80,000 to 90,000 barrels	19	14.4	1,586,000	
100,000 to 110,000 barrels	6	12.5	630,000	
120,000 to 150,000 barrels	6	20.7	785,000	
Over 150,000 barrels	9	11.1	1,521,000	
Total coastal tank barges	<u>53</u>	<u>14.7</u>	<u>5,089,000</u>	
Coastal tugboats (owned and chartered):				
1000 to 1900 horsepower	4	30.5		
2000 to 2900 horsepower	1	43.1		
3000 to 3900 horsepower	9	37.6		
4000 to 4900 horsepower	14	17.8		
5000 to 6900 horsepower	12	12.7		
Greater than 7000 horsepower	10	14.2		
Total coastal tugboats	<u>50</u>	<u>20.9</u>		
Offshore dry-bulk cargo barges (owned)	<u>4</u>	<u>20.1</u>		<u>78,000</u>
Offshore tugboats and docking tugboat (owned and chartered)	<u>5</u>	<u>27.5</u>		

The 285 inland towboats, 50 coastal tugboats, four offshore tugboats and one docking tugboat provide the power source and the 1,003 inland tank barges, 53 coastal tank barges and four offshore dry-bulk cargo barges provide the freight capacity for the marine transportation segment. When the power source and freight capacity are combined, the unit is called a tow. The Company's inland tows generally consist of one towboat and from one to up to 25 tank barges, depending upon the horsepower of the towboat, the river or canal capacity and conditions, and customer requirements. The Company's coastal and offshore tows primarily consist of one tugboat and one tank barge or dry-bulk cargo barge.

Marine Transportation Industry Fundamentals

The United States inland waterway system, composed of a network of interconnected rivers and canals that serve the nation as water highways, is one of the world's most efficient transportation systems. The nation's inland waterways are vital to the United States distribution system, with over 1.1 billion short tons of cargo moved annually on United States shallow draft waterways. The inland waterway system extends approximately 26,000 miles, 12,000 miles of which are generally considered significant for domestic commerce, through 38 states, with 635 shallow draft ports. These navigable inland waterways link the United States heartland to the world.

The United States coastal waterway system consists of ports along the Atlantic, Gulf and Pacific coasts, as well as ports in Alaska, Hawaii and on the Great Lakes. Like the inland waterways, the coastal trade is vital to the United States distribution system, particularly the regional distribution of refined petroleum products from refineries and storage facilities to a variety of destinations, including other refineries, distribution terminals, power plants and ships. In addition to distribution directly from refineries and storage facilities, coastal tank barges are used frequently to distribute products from pipelines. Many coastal markets receive refined petroleum products principally from coastal tank barges. Smaller volumes of petrochemicals are distributed from Gulf Coast plants to end users and black oil, including crude oil and natural gas condensate, is distributed regionally from refineries and terminals along the United States coast to refineries, power plants and distribution terminals.

Based on cost and safety, barge transportation is often the most efficient and safest means of surface transportation of bulk commodities when compared with railroads and trucks. The cargo capacity of a 27,500 barrel inland tank barge is the equivalent of 46 railroad tank cars or 144 tractor-trailer tank trucks. A typical Company lower Mississippi River linehaul tow of 15 barges has the carrying capacity of approximately 216 railroad tank cars plus six locomotives, or approximately 1,050 tractor-trailer tank trucks. The Company's inland tank barge fleet capacity of 21.8 million barrels equates to approximately 36,500 railroad tank cars or approximately 114,300 tractor-trailer tank trucks. Furthermore, barging is much more energy efficient. One ton of bulk product can be carried 647 miles by inland barge on one gallon of fuel, compared with 477 miles by railcar or 145 miles by truck. In the coastal trade, the carrying capacity of a 100,000 barrel tank barge is the equivalent of approximately 165 railroad tank cars or approximately 525 tractor-trailer tank trucks. The Company's coastal tank barge fleet capacity of 5.1 million barrels equates to approximately 8,400 railroad tank cars or approximately 26,700 tractor-trailer tank trucks. Marine transportation generally involves less urban exposure than railroad or truck transportation and operates on a system with few crossing junctures and in areas relatively remote from population centers. These factors generally reduce the number of waterway incidents.

Inland Tank Barge Industry

The Company operates within the United States inland tank barge industry, a diverse and independent mixture of approximately 35 large integrated transportation companies and small operators, as well as captive fleets owned by United States refining and petrochemical companies. The inland tank barge industry provides marine transportation of bulk liquid cargoes for customers and, in the case of captives, for their own account, throughout the Mississippi River and its tributaries and on the Gulf Intracoastal Waterway. The most significant markets in this industry include the transportation of petrochemicals, black oil, refined petroleum products and agricultural chemicals. The Company operates in each of these markets. The use of marine transportation by the petroleum and petrochemical industry is a major reason for the location of United States refineries and petrochemical facilities on navigable inland waterways. Texas and Louisiana currently account for approximately 80% of the United States production of petrochemicals. Much of the United States farm belt is likewise situated with access to the inland waterway system, relying on marine transportation of farm products, including agricultural chemicals. The Company's principal distribution system encompasses the Gulf Intracoastal Waterway from Brownsville, Texas, to Port St. Joe, Florida, the Mississippi River System and the Houston Ship Channel. The Mississippi River System includes the Arkansas, Illinois, Missouri, Ohio, Red, Tennessee, Yazoo, Ouachita and Black Warrior Rivers and the Tennessee-Tombigbee Waterway.

The number of tank barges that operate on the inland waterways of the United States declined from an estimated 4,200 in 1982 to 2,900 in 1993, remained relatively constant at 2,900 until 2002, decreased to 2,750 from 2002 through 2006, and then increased over the years to approximately 3,850 by the end of 2015 and 2016, and slightly decreased to an estimated 3,825 at the end of 2017 and an estimated 3,800 at the end of 2018. The Company believes the decrease from 4,200 in 1982 to 2,750 in 2006 primarily resulted from: the increasing age of the domestic tank barge fleet, resulting in scrapping; rates inadequate to justify new construction; a reduction in tax incentives, which previously encouraged speculative construction of new equipment; stringent operating standards to adequately cope with safety and environmental risk; the elimination of government regulations and programs supporting the many new small refineries and the proliferation of oil traders which created a strong demand for tank barge services; an increase in the average capacity per barge; and an increase in environmental regulations that mandate expensive equipment modification, which some owners were unwilling or unable to undertake given capital constraints and the age of their fleets. The cost of tank barge hull work for required periodic United States Coast Guard (“USCG”) certifications, as well as general safety and environmental concerns, force operators to periodically reassess their ability to recover maintenance costs. The increase from 2,750 in 2006 to approximately 3,850 by the end of 2016 primarily resulted from increased barge construction and deferred retirements due to strong demand and resulting capacity shortages. The decrease to 3,800 in 2018 was primarily due to continued industry-wide tank barge retirements and minimal new inland tank barge construction. The Company’s 1,003 inland tank barges represent approximately 26% of the industry’s 3,800 inland tank barges.

For 2017, the Company estimated that industry-wide 75 tank barges were placed in service and 100 tank barges were retired. For 2018, the Company estimated that industry-wide 75 tank barges were placed in service and 100 tank barges were retired. During 2016 and 2017, the decline in industry-wide demand for the movement of crude oil and natural gas condensate, and the subsequent transfer of inland crude oil barges to other tank barge markets, created excess industry-wide tank barge capacity. During 2018, demand for inland tank barge transportation and industry utilization rates increased above 90% due to a favorable pricing environment for customers’ products, new petrochemical industry capacity that led to increased movements of petrochemicals, and higher volumes of crude oil moved from the northern U.S. to the Gulf Coast. As a result of these improved market conditions, the Company estimates that approximately 150 tank barges have been ordered during 2018 for delivery throughout 2019. The risk of an oversupply of tank barges may be mitigated by increased petrochemical, black oil and refined petroleum products volumes from increased production from current facilities, plant expansions or the opening of new facilities, and the fact that the inland tank barge industry has approximately 400 tank barges over 30 years old and approximately 240 of those over 40 years old, which could lead to retirement of older tank barges.

The average age of the nation’s inland tank barge fleet is approximately 16 years. Neither the Company, nor the industry, operates any single hull inland tank barges. Single hull tank barges were required by current federal law to either be retrofitted with double hulls or phased out of domestic service by December 31, 2014.

The Company’s inland marine transportation segment also owns a shifting operation and fleet facility for dry cargo barges and tank barges on the Houston Ship Channel and in Freeport, Texas, and a shipyard for the building of inland towboats and providing routine maintenance on marine vessels. The Company also owns a two-thirds interest in Osprey Line, L.L.C. (“Osprey”), a transporter of project cargoes and cargo containers by barge on the United States inland waterway system.

Coastal Tank Barge Industry

The Company also operates in the United States coastal tank barge industry, operating tank barges in the 195,000 barrel or less category. This market is composed of approximately 15 large integrated transportation companies and small operators. The 195,000 barrel or less category coastal tank barge industry primarily provides regional marine transportation distribution of bulk liquid cargoes along the United States’ Atlantic, Gulf and Pacific coasts, in Alaska and Hawaii and, to a lesser extent, on the Great Lakes. Products transported are primarily refined petroleum products and black oil from refineries and storage facilities to a variety of destinations, including other refineries, distribution terminals, power plants and ships, the regional movement of crude oil and natural gas condensate to Gulf Coast, Northeast and West Coast refineries, and the movement of petrochemicals primarily from Gulf Coast petrochemical facilities to end users.

The number of coastal tank barges that operate in the 195,000 barrel or less category is approximately 290, of which the Company operates 53 or approximately 18%. The average age of the nation's coastal tank barge fleet is approximately 13 years. In June 2018, the Company purchased a 155,000 barrel coastal articulated tank barge and tugboat unit ("ATB") under construction from another operator that was delivered to the Company in the 2018 fourth quarter. The Company is aware of five coastal ATBs under construction by competitors for delivery in 2019 and 2020, including three that are in the 195,000 barrels or less category and two that are over 195,000 barrels. The coastal tank barge fleet has approximately 15 tank barges over 30 years old. The number of older tank barges, coupled with low industry-wide utilization levels and ballast water treatment regulations, could lead to further retirements of older tank barges in the next few years.

Competition in the Tank Barge Industry

The tank barge industry remains very competitive. Competition in this business has historically been based primarily on price; however, most of the industry's customers, through an increased emphasis on safety, the environment, and quality, are more frequently requiring that their supplier of tank barge services have the capability to handle a variety of tank barge requirements. These requirements include distribution capability throughout the inland waterway system and coastal markets, with high levels of flexibility, and an emphasis on safety, environmental responsibility and financial responsibility, as well as adequate insurance and high quality of service consistent with the customer's own operational standards.

In the inland markets, the Company's direct competitors are primarily noncaptive inland tank barge operators. "Captive" fleets are owned by major oil and petrochemical companies which occasionally compete in the inland tank barge market, but primarily transport cargoes for their own account. The Company is the largest inland tank barge carrier, both in terms of number of barges and total fleet barrel capacity. The Company's inland tank barge fleet has grown from 71 tank barges in 1988 to 1,003 tank barges as of February 22, 2019, or approximately 26% of the estimated total number of domestic inland tank barges.

In the coastal markets, the Company's direct competitors are the operators of United States tank barges in the 195,000 barrels or less category. Coastal tank barges in the 195,000 barrels or less category have the ability to enter the large majority of coastal ports. Ocean-going tank barges and United States product tankers in the 300,000 barrels plus category, excluding the fleet of large tankers dedicated to Alaska crude oil transportation, primarily move large volumes of refined petroleum products within the Gulf of Mexico with occasional movements from the Gulf Coast to the East Coast, along the West Coast and from Texas and Louisiana to Florida. There are approximately 50 such vessels and, because of their size, their access to ports is limited by terminal size and draft restrictions.

While the Company competes primarily with other tank barge companies, it also competes with companies who operate refined product and petrochemical pipelines, railroad tank cars and tractor-trailer tank trucks. As noted above, the Company believes that both inland and coastal marine transportation of bulk liquid products enjoy a substantial cost advantage over railroad and truck transportation. The Company believes that refined product and crude oil pipelines, although often a less expensive form of transportation than inland and coastal tank barges, are not as adaptable to diverse products and are generally limited to fixed point-to-point distribution of commodities in high volumes over extended periods of time.

Products Transported

The Company transports petrochemicals, black oil, refined petroleum products and agricultural chemicals by tank barge throughout the Mississippi River System, on the Gulf Intracoastal Waterway, coastwise along all three United States coasts and in Alaska and Hawaii. During 2018, the Company's inland marine transportation operation moved over 50 million tons of liquid cargo on the United States inland waterway system.

Petrochemicals. Bulk liquid petrochemicals transported include such products as benzene, styrene, methanol, acrylonitrile, xylene, naphtha and caustic soda, all consumed in the production of paper, fiber and plastics. Pressurized products, including butadiene, isobutane, propylene, butane and propane, all requiring pressurized conditions to remain in stable liquid form, are transported in pressure barges. The transportation of petrochemical products represented 56% of the segment's 2018 revenues. Customers shipping these products are petrochemical and refining companies.

Black Oil. Black oil transported includes such products as residual fuel oil, No. 6 fuel oil, coker feedstock, vacuum gas oil, asphalt, carbon black feedstock, crude oil, natural gas condensate and ship bunkers (engine fuel). Such products represented 21% of the segment's 2018 revenues. Black oil customers are refining companies, marketers and end users that require the transportation of black oil between refineries and storage terminals, to refineries and to power plants. Ship bunker customers are oil companies and oil traders in the bunkering business.

Refined Petroleum Products. Refined petroleum products transported include the various blends of finished gasoline, gasoline blendstocks, jet fuel, No. 2 oil, heating oil and diesel fuel, and represented 19% of the segment's 2018 revenues. The Company also classifies ethanol in the refined petroleum products category. Customers are oil and refining companies, marketers and ethanol producers.

Agricultural Chemicals. Agricultural chemicals transported represented 4% of the segment's 2018 revenues. Agricultural chemicals include anhydrous ammonia and nitrogen-based liquid fertilizer, as well as industrial ammonia. Agricultural chemical customers consist mainly of domestic and foreign producers of such products.

Demand Drivers in the Tank Barge Industry

Demand for tank barge transportation services is driven by the production volumes of the bulk liquid commodities transported by barge. Marine transportation demand for the segment's four primary commodity groups, petrochemicals, black oil, refined petroleum products and agricultural chemicals, is based on differing circumstances. While the demand drivers of each commodity are different, the Company has the flexibility in certain cases of re-allocating inland equipment and coastal equipment among the petrochemical, refined petroleum products and crude oil markets as needed.

Bulk petrochemical volumes have historically tracked the general domestic economy and correlate to the United States Gross Domestic Product. The United States petrochemical industry continues to see strong production levels for both domestic consumption and exports. Low priced domestic natural gas, a basic feedstock for the United States petrochemical industry, has provided the industry with a competitive advantage against foreign petrochemical producers. As a result, United States petrochemical production has remained stable during 2018, 2017 and 2016, thereby producing increased marine transportation volumes of basic petrochemicals to both domestic consumers and terminals for export destinations. Petrochemical products are used primarily in consumer non-durable and durable goods. From late 2010 through 2015, inland petrochemical tank barge utilization remained relatively stable in the 90% to 95% range. During 2016, utilization declined to the high 80% range on average with periods of utilization in the low 80% range. During 2017 and 2018, utilization ranged from the mid-80% to the mid-90% range, reaching the mid-90% range in the late 2017 third quarter from the impact of Hurricanes Harvey and Irma, and in the low to mid-90% range during the 2017 fourth quarter and the majority of the 2018 year as a result of a favorable pricing environment for customers' products, new petrochemical industry capacity that led to increased movements of petrochemicals, and the continued retirement of older barges from the segment's fleet. Coastal tank barge utilization for the transportation of petrochemicals during 2016 was in the low 90% range and for 2017 utilization declined from the low 60% to low 80%. During 2018, coastal tank barge utilization levels ranged improved from the high 70% range in the 2018 first quarter to the 80% range during the 2018 second, third and fourth quarters, reflecting the impairment and retirement of 12 out-of-service coastal barges during the 2017 fourth quarter. Utilization in the coastal marine fleet continued to be impacted by the oversupply of tank barges in the coastal market.

The demand for black oil, including ship bunkers, varies by type of product transported. Demand for transportation of residual oil, a heavy by-product of refining operations, varies with refinery utilization and usage of feedstocks. During the majority of 2015, inland black oil tank barge utilization remained strong, in the 90% to 95% range, due to strong demand driven by steady refinery production levels from major customers, and the export of diesel fuel and heavy fuel oil. With the decline in the price of crude oil in late 2014 and the low price throughout 2015 and 2016, movements by tank barge of crude oil and natural gas condensate were at reduced levels industry-wide. During 2015 and 2016, the Company and the industry were generally successful in moving barges from that trade to other markets. During 2016, 2017 and 2018, the Company continued to transport crude oil and natural gas condensate produced from the Eagle Ford and Permian Basin shale formations in Texas both along the Gulf Intracoastal Waterway with inland vessels and in the Gulf of Mexico with coastal equipment, and continued to transport Utica crude oil and natural gas condensate downriver from the Mid-Atlantic to the Gulf Coast, however, at reduced levels as some of the product was transported by newly constructed pipelines. The decline in demand for crude oil and natural gas condensate movements and an industry-wide oversupply of inland tank barges resulted in a decline in inland black oil tank barge utilization in 2016 to the low-to-mid 80% range and in 2017 to the mid-80% to low 90% range for the first three quarters and low to mid-90% range for the fourth quarter. During 2018, inland black oil tank barge utilization was in the mid-90% range. Coastal black oil tank barge utilization declined from the 90% to 95% range for the majority of 2015 to the low 80% range by the end of 2016, the low 60% to low 80% range during 2017 and low to mid-80% range during 2018, partly attributable to the decrease in the movements of crude oil and natural gas condensate and to the continued industry-wide oversupply of tank barges in the coastal industry. Inland and coastal asphalt shipments are generally seasonal, with higher volumes shipped during April through November, months when weather allows for efficient road construction. The Company saw seasonally normal cessation of most operations in Alaska in the 2016, 2017 and 2018 first and fourth quarters.

Refined petroleum product volumes are driven by United States gasoline and diesel fuel consumption, principally vehicle usage, air travel and weather conditions. Volumes can also relate to gasoline inventory imbalances within the United States. Generally, gasoline and No. 2 oil are exported from the Gulf Coast where refining capacity exceeds demand. The Midwest is a net importer of such products. Volumes were also driven by diesel fuel transported to terminals along the Gulf Coast for export to South America. Ethanol, produced in the Midwest, is moved from the Midwest to Gulf Coast customers. In the coastal trade, tank barges are frequently used regionally to transport refined petroleum products from a coastal refinery or terminals served by pipelines to the end markets. Many coastal areas have access to refined petroleum products only by using marine transportation as the last link in the distribution chain. Coastal refined petroleum products tank barge utilization declined from the 90% to 95% range for the majority of 2015 to the low-to-mid 80% range for the majority of 2016, and declined throughout 2017 from a low 80% range in first quarter to the low 60% range in the fourth quarter, all predominately from the industry-wide oversupply of coastal tank barge capacity. In 2018, utilization increased into the 80% range primarily due to the impairment and retirement of out-of-service coastal barges during the 2017 fourth quarter.

Demand for marine transportation of domestic and imported agricultural fertilizer is seasonal and directly related to domestic nitrogen-based liquid fertilizer consumption, driven by the production of corn, cotton and wheat. During periods of high natural gas prices, the manufacturing of nitrogen-based liquid fertilizer in the United States is curtailed. During these periods, imported products, which normally involve longer barge trips, replace the domestic products to meet Midwest and South Texas demands. Such products are delivered to the numerous small terminals and distributors throughout the United States farm belt.

Marine Transportation Operations

The marine transportation segment operates a fleet of 1,003 inland tank barges and 285 inland towboats, as well as 53 coastal tank barges and 50 coastal tugboats. The segment also operates four offshore dry-bulk cargo barges, four offshore tugboats and one docking tugboat transporting dry-bulk commodities in United States coastal trade.

Inland Operations. The segment's inland operations are conducted through a wholly owned subsidiary, Kirby Inland Marine, LP ("Kirby Inland Marine"). Kirby Inland Marine's operations consist of the Canal, Linehaul and River fleets, as well as barge fleet services.

The Canal fleet transports petrochemical feedstocks, processed chemicals, pressurized products, black oil, and refined petroleum products along the Gulf Intracoastal Waterway, the Mississippi River below Baton Rouge, Louisiana, and the Houston Ship Channel. Petrochemical feedstocks and certain pressurized products are transported from one plant to another plant for further processing. Processed chemicals and certain pressurized products are moved to waterfront terminals and chemical plants. Black oil is transported to waterfront terminals and products such as No. 6 fuel oil are transported directly to the end users. Refined petroleum products are transported to waterfront terminals along the Gulf Intracoastal Waterway for distribution.

The Linehaul fleet transports petrochemical feedstocks, chemicals, agricultural chemicals and lube oils along the Gulf Intracoastal Waterway, Mississippi River and the Illinois and Ohio Rivers. Loaded tank barges are staged in the Baton Rouge area from Gulf Coast refineries and petrochemical plants, and are transported from Baton Rouge to waterfront terminals and plants on the Mississippi, Illinois and Ohio Rivers, and along the Gulf Intracoastal Waterway, on regularly scheduled linehaul tows. Barges are dropped off and picked up going up and down river.

The River fleet transports petrochemical feedstocks, chemicals, refined petroleum products, agricultural chemicals and black oil along the Mississippi River System above Baton Rouge. The River fleet operates unit tows, where a towboat and generally a dedicated group of barges operate on consecutive voyages between loading and discharge points. Petrochemical feedstocks and processed chemicals are transported to waterfront petrochemical and chemical plants, while black oil, refined petroleum products and agricultural chemicals are transported to waterfront terminals.

The inland transportation of petrochemical feedstocks, chemicals and pressurized products is generally consistent throughout the year. Transportation of refined petroleum products, certain black oil and agricultural chemicals is generally more seasonal. Movements of black oil, such as asphalt, generally increase in the spring through fall months. Movements of refined petroleum products, such as gasoline blends, generally increase during the summer driving season, while heating oil movements generally increase during the winter months. Movements of agricultural chemicals generally increase during the spring and fall planting seasons.

The marine transportation inland operation moves and handles a broad range of sophisticated cargoes. To meet the specific requirements of the cargoes transported, the inland tank barges may be equipped with self-contained heating systems, high-capacity pumps, pressurized tanks, refrigeration units, stainless steel tanks, aluminum tanks or specialty coated tanks. Of the 1,003 inland tank barges currently operated, 789 are petrochemical and refined petroleum products barges, 131 are black oil barges, 73 are pressure barges and 10 are refrigerated anhydrous ammonia barges. Of the 1,003 inland tank barges, 972 are owned by the Company and 31 are leased.

The fleet of 285 inland towboats ranges from 800 to 6400 horsepower. Of the 285 inland towboats, 199 are owned by the Company and 86 are chartered. Towboats in the 800 to 2100 horsepower classes provide power for barges used by the Canal and Linehaul fleets on the Gulf Intracoastal Waterway and the Houston Ship Channel. Towboats in the 1400 to 3200 horsepower classes provide power for both the River and Linehaul fleets on the Gulf Intracoastal Waterway and the Mississippi River System. Towboats above 3600 horsepower are typically used on the Mississippi River System to move River fleet unit tows and provide Linehaul fleet towing. Based on the capabilities of the individual towboats used in the Mississippi River System, the tows range in size from 10,000 to 30,000 tons.

Marine transportation services for inland movements are conducted under long-term contracts, typically ranging from one to three years, some of which have renewal options, with customers with whom the Company has traditionally had long-standing relationships, as well as under spot contracts. During the first nine months of 2016, approximately 80% of the inland marine transportation revenues were under term contracts and 20% were spot contract revenues. During the 2016 fourth quarter and all of 2017, approximately 75% of inland marine transportation revenues were under term contracts and 25% were spot contract revenues. During 2018, approximately 65% of inland marine transportation revenues were under term contracts and 35% were spot contract revenues.

All of the Company's inland tank barges used in the transportation of bulk liquid products are of double hull construction and, where applicable, are capable of controlling vapor emissions during loading and discharging operations in compliance with occupational safety and health regulations and air quality regulations.

The Company is one of the few inland tank barge operators with the ability to offer to its customers' distribution capabilities throughout the Mississippi River System and the Gulf Intracoastal Waterway. Such capabilities offer economies of scale resulting from the ability to match tank barges, towboats, products and destinations more efficiently.

Through the Company's proprietary vessel management computer system, the fleet of barges and towboats is dispatched from a centralized dispatch at the corporate office. The towboats are equipped with satellite positioning and communication systems that automatically transmit the location of the towboat to the Company's customer service department located in its corporate office. Electronic orders are communicated to the vessel personnel with reports of towing activities communicated electronically back to the customer service department. The electronic interface between the customer service department and the vessel personnel enables more effective matching of customer needs to barge capabilities, thereby maximizing utilization of the tank barge and towboat fleet. The Company's customers are able to access information concerning the movement of their cargoes, including barge locations, through the Company's website.

Kirby Inland Marine operates the largest commercial tank barge fleet service (temporary barge storage facilities) in numerous ports, including Houston, Corpus Christi, Freeport and Orange, Texas, Baton Rouge, Covington and New Orleans, Louisiana, Mobile, Alabama and Greenville, Mississippi. Included in the fleet service is a shifting operation and fleet service for dry cargo barges and tank barges on the Houston Ship Channel and in Freeport, Texas. Kirby Inland Marine provides service for its own barges, as well as outside customers, transferring barges within the areas noted, as well as fleet barges.

Kirby Inland Marine also provides shore-based barge tankermen to the Company and third parties. Services to the Company and third parties cover the Gulf Coast, mid-Mississippi Valley, and the Ohio River Valley.

San Jac Marine, Inc. ("San Jac"), a subsidiary of Kirby Inland Marine, owns and operates a shipyard in Channelview, Texas used to build marine vessels for both inland and coastal applications, and provide maintenance and repair services. Kirby Inland Marine is also building inland towboats and performing routine maintenance and repairs at the shipyard.

The Company owns a two-thirds interest in Osprey, which transports project cargoes and cargo containers by barge on the United States inland waterway system.

Coastal Operations. The segment's coastal operations are conducted through wholly owned subsidiaries, Kirby Offshore Marine, LLC ("Kirby Offshore Marine") and Kirby Ocean Transport Company ("Kirby Ocean Transport").

Kirby Offshore Marine provides marine transportation of refined petroleum products, petrochemicals and black oil in coastal regions of the United States. The coastal operations consist of the Atlantic and Pacific Divisions.

The Atlantic Division primarily operates along the eastern seaboard of the United States and along the Gulf Coast. The Atlantic Division vessels call on coastal states from Maine to Texas, servicing refineries, storage terminals and power plants. The Atlantic Division also operates equipment, to a lesser extent, in the Eastern Canadian provinces. The tank barges operating in the Atlantic Division are in the 10,000 to 194,000 barrel capacity range and coastal tugboats in the 2400 to 10000 horsepower range, transporting primarily refined petroleum products, petrochemicals and black oil.

The Pacific Division primarily operates along the Pacific Coast of the United States, servicing refineries and storage terminals from Southern California to Washington State, throughout Alaska, including Dutch Harbor, Cook Inlet and the Alaska River Systems, and from California to Hawaii. The Pacific Division's fleet consists of tank barges in the 52,000 to 194,000 barrel capacity range and tugboats in the 1000 to 11000 horsepower range, transporting primarily refined petroleum products.

The Pacific Division also services local petroleum retailers and oil companies distributing refined petroleum products and black oil between the Hawaiian Islands and provides other services to the local maritime community. The Hawaii fleet consists of tank barges in the 53,000 to 86,000 barrel capacity range and tugboats in the 1000 to 5000 horsepower range, transporting refined petroleum products for local and regional customers, black oil to power generation customers and delivering bunker fuel to ships. The Hawaii fleet also provides service docking, standby tug assistance and line handling to vessels using the Single Point Mooring installation at Barbers Point, Oahu, a facility for large tankers to safely load and discharge their cargoes through an offshore buoy and submerged pipeline without entering the port.

The coastal transportation of refined petroleum products and black oil is impacted by seasonality, partially dependent on the area of operations. Operations along the West Coast and in Alaska have been subject to more seasonal variations in demand than the operations along the East Coast and Gulf Coast regions. Seasonality generally does not impact the Hawaiian market. Movements of refined petroleum products such as various blends of gasoline are strongest during the summer driving season while heating oil generally increases during the winter months.

The coastal fleet consists of 53 tank barges with 5.1 million barrels of capacity, primarily transporting refined petroleum products, black oil and petrochemicals. The Company owns 49 of the coastal tank barges and four are leased. Of the 53 coastal tank barges currently operating, 37 are refined petroleum products and petrochemical barges and 16 are black oil barges. The Company operates 50 coastal tugboats ranging from 1000 to 11000 horsepower, of which 46 are owned by the Company and four are chartered.

Coastal marine transportation services are conducted under long-term contracts, primarily one year or longer, some of which have renewal options, for customers with which the Company has traditionally had long-standing relationships, as well as under spot contracts. During 2016, 2017 and 2018, approximately 80% of the coastal marine transportation revenues were under term contracts and 20% were spot contract revenues.

Kirby Offshore Marine also operates a fleet of two offshore dry-bulk barge and tugboat units involved in the transportation of sugar and other dry products between Florida and East Coast ports. These vessels primarily operate under contracts of affreightment that are typically one year or less in length.

Kirby Ocean Transport owns and operates a fleet of two offshore dry-bulk barges, two offshore tugboats and one docking tugboat. Kirby Ocean Transport operates primarily under term contracts of affreightment, including a contract that expires in 2020 with Duke Energy Florida (“DEF”) to transport coal across the Gulf of Mexico to DEF’s power generation facility at Crystal River, Florida.

Kirby Ocean Transport is also engaged in the transportation of coal, fertilizer, sugar and other bulk cargoes on a short-term basis between domestic ports and occasionally the transportation of grain from domestic ports to ports primarily in the Caribbean Basin.

Contracts and Customers

Marine transportation inland and coastal services are conducted under term contracts, typically ranging from one to three years, some of which have renewal options, for customers with whom the Company has traditionally had long-standing relationships, as well as under spot contracts. The majority of the marine transportation contracts with its customers are for terms of one year. Most have been customers of the Company’s marine transportation segment for many years and management anticipates continued relationships; however, there is no assurance that any individual contract will be renewed.

A term contract is an agreement with a specific customer to transport cargo from a designated origin to a designated destination at a set rate (affreightment) or at a daily rate (time charter). The rate may or may not include escalation provisions to recover changes in specific costs such as fuel. Time charters, which insulate the Company from revenue fluctuations caused by weather and navigational delays and temporary market declines, represented approximately 59% of the marine transportation’s inland revenues under term contracts during 2018, 49% of revenue under term contracts during 2017 and 52% of the revenue under term contracts during 2016. A spot contract is an agreement with a customer to move cargo from a specific origin to a designated destination for a rate negotiated at the time the cargo movement takes place. Spot contract rates are at the current “market” rate and are subject to market volatility. The Company typically maintains a higher mix of term contracts to spot contracts to provide the Company with a more predictable revenue stream while maintaining spot market exposure to take advantage of new business opportunities and existing customers’ peak demands. During the first nine months of 2016, approximately 80% of the inland marine transportation revenues were under term contracts and 20% were spot contract revenues. During the 2016 fourth quarter and all of 2017, approximately 75% of inland marine transportation revenues were under term contracts and 25% were spot contract revenues. During 2018, approximately 65% of inland marine transportation revenues were under term contracts and 35% were spot contract revenues. Coastal time charters represented approximately 85% of the marine transportation coastal revenues under term contracts in 2018, 2017 and 2016.

No single customer of the marine transportation segment accounted for 10% or more of the Company's revenues in 2018, 2017 and 2016.

Employees

The Company's marine transportation segment has approximately 3,050 employees, of which approximately 2,350 are vessel crew members. None of the segment's inland operations are subject to collective bargaining agreements. The segment's coastal operations include approximately 650 vessel employees some of which are subject to collective bargaining agreements in certain geographic areas. Approximately 250 Kirby Offshore Marine vessel crew members employed in the Atlantic Division are subject to a collective bargaining agreement with the Richmond Terrace Bargaining Unit in effect through August 31, 2019. In addition, approximately 150 Penn Maritime Inc. vessel crew members are represented by the Seafarers International Union under a collective bargaining agreement in effect through April 30, 2019.

Properties

The principal offices of Kirby Inland Marine, Kirby Offshore Marine, Kirby Ocean Transport and Osprey are located in Houston, Texas, in three facilities under leases that expire in July 2021, December 2025 and December 2027. Kirby Inland Marine's operating locations are on the Mississippi River at Baton Rouge and New Orleans, Louisiana, and Greenville, Mississippi, three locations in Houston, Texas, on or near the Houston Ship Channel, one in Mobile, Alabama, one in Miami, Florida, one in Covington, Louisiana, one in Corpus Christi, Texas, and one in Orange, Texas. The New Orleans, Houston and Orange facilities are owned by the Company, and the Baton Rouge, Corpus Christi, Covington, Greenville, Miami and Mobile facilities are leased. Kirby Offshore Marine's operating facilities are located in Staten Island, New York, Seattle, Washington and Honolulu, Hawaii. All of Kirby Offshore Marine's operating facilities are leased, including piers and wharf facilities and office and warehouse space. San Jac's operating location is near the Houston Ship Channel.

Governmental Regulations

General. The Company's marine transportation operations are subject to regulation by the USCG, federal laws, state laws and certain international conventions.

Most of the Company's tank barges are inspected by the USCG and carry certificates of inspection. The Company's inland and coastal towing vessels and coastal dry-bulk barges are also subject to USCG regulations. The USCG has enacted safety regulations governing the inspection, standards, and safety management systems of towing vessels. The regulations also create many new requirements for design, construction, equipment, and operation of towing vessels. The USCG regulations supersede the jurisdiction of the United States Occupational Safety and Health Administration ("OSHA") and any state regulations on vessel design, construction, alteration, repair, maintenance, operation, equipping, personnel qualifications and manning. The regulations requiring towing vessels to obtain a certificate of inspection became effective for existing towing vessels on July 20, 2018. Other portions of the regulations are phased in following the July 20, 2018 effective date.

Most of the Company's coastal tugboats and coastal tank and dry-bulk barges are built to American Bureau of Shipping ("ABS") classification standards and are inspected periodically by ABS to maintain the vessels in class. The crews employed by the Company aboard vessels, including captains, pilots, engineers, tankermen and ordinary seamen, are licensed by the USCG.

The Company is required by various governmental agencies to obtain licenses, certificates and permits for its vessels depending upon such factors as the cargo transported, the waters in which the vessels operate and other factors. The Company is of the opinion that the Company's vessels have obtained and can maintain all required licenses, certificates and permits required by such governmental agencies for the foreseeable future.

The Company believes that additional security and environmental related regulations could be imposed on the marine industry in the form of contingency planning requirements. Generally, the Company endorses the anticipated additional regulations and believes it is currently operating to standards at least equal to anticipated additional regulations.

Jones Act. The Jones Act is a federal cabotage law that restricts domestic marine transportation in the United States to vessels built and registered in the United States, manned by United States citizens, and owned and operated by United States citizens. For a corporation to qualify as United States citizens for the purpose of domestic trade, it is to be 75% owned and controlled by United States citizens. The Company monitors citizenship and meets the requirements of the Jones Act for its vessels.

Compliance with United States ownership requirements of the Jones Act is important to the operations of the Company, and the loss of Jones Act status could have a material negative effect on the Company. The Company monitors the citizenship of its employees and stockholders.

User Taxes. Federal legislation requires that inland marine transportation companies pay a user tax based on propulsion fuel used by vessels engaged in trade along the inland waterways that are maintained by the United States Army Corps of Engineers. Such user taxes are designed to help defray the costs associated with replacing major components of the inland waterway system, such as locks and dams. A significant portion of the inland waterways on which the Company's vessels operate is maintained by the Army Corps of Engineers.

The Company presently pays a federal fuel user tax of 29.1 cents per gallon consisting of a .1 cent per gallon leaking underground storage tank tax and 29 cents per gallon waterways user tax.

Security Requirements. The Maritime Transportation Security Act of 2002 requires, among other things, submission to and approval by the USCG of vessel and waterfront facility security plans ("VSP" and "FSP", respectively). The Company's VSP and FSP have been approved and the Company is operating in compliance with the plans for all of its vessels and facilities that are subject to the requirements.

Environmental Regulations

The Company's operations are affected by various regulations and legislation enacted for protection of the environment by the United States government, as well as many coastal and inland waterway states and international jurisdictions to the extent that the Company's vessels transit in international waters. Government regulations require the Company to obtain permits, licenses and certificates for the operation of its vessels. Failure to maintain necessary permits or approvals could require the Company to incur costs or temporarily suspend operation of one or more of its vessels.

Water Pollution Regulations. The Federal Water Pollution Control Act of 1972, as amended by the Clean Water Act of 1977 ("Clean Water Act"), the Comprehensive Environmental Response, Compensation and Liability Act of 1981 ("CERCLA") and the Oil Pollution Act of 1990 ("OPA") impose strict prohibitions against the discharge of oil and its derivatives or hazardous substances into the navigable waters of the United States. These acts impose civil and criminal penalties for any prohibited discharges and impose substantial strict liability for cleanup of these discharges and any associated damages. Certain states also have water pollution laws that prohibit discharges into waters that traverse the state or adjoin the state, and impose civil and criminal penalties and liabilities similar in nature to those imposed under federal laws.

The OPA and various state laws of similar intent substantially increased over historic levels the statutory liability of owners and operators of vessels for oil spills, both in terms of limit of liability and scope of damages.

One of the most important requirements under the OPA was that all newly constructed tank barges engaged in the transportation of oil and petroleum in the United States be double hulled, and all existing single hull tank barges be either retrofitted with double hulls or phased out of domestic service by December 31, 2014.

The Company manages its exposure to losses from potential discharges of pollutants through the use of well-maintained and equipped vessels, through safety, training and environmental programs, and through the Company's insurance program. There can be no assurance, however, that any new regulations or requirements or any discharge of pollutants by the Company will not have an adverse effect on the Company.

Clean Water Act. The United States Environmental Protection Agency ("EPA") regulates the discharge of ballast water and other substances in United States waters under the Clean Water Act. Effective February 6, 2009, EPA regulations required vessels 79 feet in length or longer to comply with a Vessel General Permit authorizing ballast water discharges and other discharges incidental to the operation of the vessels. The EPA regulations also imposed technology and water quality based effluent limits for certain types of discharges and established specific inspection, monitoring, recordkeeping and reporting requirements for vessels to ensure effluent limitations are met. The Vessel Incidental Discharge Act ("VIDA"), signed into law on December 4, 2018, establishes a new framework for the regulation of vessel incidental discharges under the Clean Water Act. VIDA requires the EPA to develop performance standards for those discharges within two years of enactment and requires the USCG to develop implementation, compliance, and enforcement regulations within two years of the EPA's promulgation of standards. Under VIDA, all provisions of the Vessel General Permit which became effective December 19, 2013, remain in force and effect until the USCG regulations are finalized. The Company maintains Vessel General Permits and has established recordkeeping and reporting procedures in compliance with these obligations.

The USCG adopted regulations on ballast water management treatment systems establishing a standard for the allowable concentration of living organisms in certain vessel ballast water discharged in waters of the United States under the National Invasive Species Act. The regulations include requirements for the installation of engineering equipment to treat ballast water by establishing an approval process for ballast water management systems ("BWMS"). The BWMS implementation was suspended until December 2016 at which time the USCG approved manufacturers' systems that met the regulatory discharge standard equivalent to the International Maritime Organization's D-2 standard. The phase-in schedule for those existing vessels requiring a system to install a BWMS is dependent on vessel build date, ballast water capacity, and drydock schedule. Compliance with the ballast water treatment regulations requires the installation of equipment on some of the Company's vessels to treat ballast water before it is discharged. The installation of BWMS equipment will require significant capital expenditures at the next scheduled drydocking to complete the installation of the approved system on those existing vessels that require a system in order to comply with the BWMS regulations.

Financial Responsibility Requirement. Commencing with the Federal Water Pollution Control Act of 1972, as amended, vessels over 300 gross tons operating in the Exclusive Economic Zone of the United States have been required to maintain evidence of financial ability to satisfy statutory liabilities for oil and hazardous substance water pollution. This evidence is in the form of a Certificate of Financial Responsibility ("COFR") issued by the USCG. The majority of the Company's tank barges are subject to this COFR requirement, and the Company has fully complied with this requirement since its inception. The Company does not foresee any current or future difficulty in maintaining the COFR certificates under current rules.

Clean Air Regulations. The Federal Clean Air Act of 1979 requires states to draft State Implementation Plans ("SIPs") designed to reduce atmospheric pollution to levels mandated by this act. Several SIPs provide for the regulation of barge loading and discharging emissions. The implementation of these regulations requires a reduction of hydrocarbon emissions released into the atmosphere during the loading of most petroleum products and the degassing and cleaning of barges for maintenance or change of cargo. These regulations require operators who operate in these states to install vapor control equipment on their barges. The Company expects that future emission regulations will be developed and will apply this same technology to many chemicals that are handled by barge. Most of the Company's barges engaged in the transportation of petrochemicals, chemicals and refined petroleum products are already equipped with vapor control systems. Although a risk exists that new regulations could require significant capital expenditures by the Company and otherwise increase the Company's costs, the Company believes that, based upon the regulations that have been proposed thus far, no material capital expenditures beyond those currently contemplated by the Company and no material increase in costs are likely to be required.

Contingency Plan Requirement. The OPA and several state statutes of similar intent require the majority of the vessels and terminals operated by the Company to maintain approved oil spill contingency plans as a condition of operation. The Company has approved plans that comply with these requirements. The OPA also requires development of regulations for hazardous substance spill contingency plans. The USCG has not yet promulgated these regulations; however, the Company anticipates that they will not be more difficult to comply with than the oil spill plans.

Occupational Health Regulations. The Company's inspected vessel operations are primarily regulated by the USCG for occupational health standards. Uninspected vessel operations and the Company's shore personnel are subject to OSHA regulations. The Company believes that it is in compliance with the provisions of the regulations that have been adopted and does not believe that the adoption of any further regulations will impose additional material requirements on the Company. There can be no assurance, however, that claims will not be made against the Company for work related illness or injury, or that the further adoption of health regulations will not adversely affect the Company.

Insurance. The Company's marine transportation operations are subject to the hazards associated with operating vessels carrying large volumes of bulk cargo in a marine environment. These hazards include the risk of loss of or damage to the Company's vessels, damage to third parties as a result of collision, fire or explosion, loss or contamination of cargo, personal injury of employees and third parties, and pollution and other environmental damages. The Company maintains insurance coverage against these hazards. Risk of loss of or damage to the Company's vessels is insured through hull insurance currently insuring approximately \$3.7 billion in hull values. Liabilities such as collision, cargo, environmental, personal injury and general liability are insured up to \$1.3 billion per occurrence. The Company also maintains insurance coverage to address commercial liabilities arising in connection with its distribution and services segment.

Environmental Protection. The Company has a number of programs that were implemented to further its commitment to environmental responsibility in its operations. In addition to internal environmental audits, one such program is environmental audits of barge cleaning vendors principally directed at management of cargo residues and barge cleaning wastes. Another is the participation by the Company in the American Waterways Operators Responsible Carrier program which is oriented towards continuously reducing the barge industry's impact on the environment, including the distribution services area.

Safety. The Company manages its exposure to the hazards associated with its business through safety, training and preventive maintenance efforts. The Company places considerable emphasis on safety through a program oriented toward extensive monitoring of safety performance for the purpose of identifying trends and initiating corrective action, and for the purpose of rewarding personnel achieving superior safety performance.

Training. The Company believes that among the major elements of a successful and productive work force are effective training programs. The Company also believes that training in the proper performance of a job enhances both the safety and quality of the service provided. New technology, regulatory compliance, personnel safety, quality and environmental concerns create additional demands for training. The Company has developed and instituted effective training programs.

Centralized training is provided through the Operations Personnel and Training Department, which is charged with developing, conducting and maintaining training programs for the benefit of all of the Company's operating entities. It is also responsible for ensuring that training programs are both consistent and effective. The Company's training facility includes state-of-the-art equipment and instruction aids, including a full bridge wheelhouse simulator, a working towboat, two tank barges and a tank barge simulator for tankermen training. During 2018, approximately 1,100 certificates were issued for the completion of courses at the training facility, of which approximately 550 were USCG approved classes and the balance were employee development and Company required classes, including Leadership and Defensive Driving.

Quality. Kirby Inland Marine has made a substantial commitment to the implementation, maintenance and improvement of Quality Assurance Systems in compliance with the International Quality Standard, ISO 9001. Kirby Offshore Marine is certified under ABS ISM standards. These Quality Assurance Systems and certification have enabled both shore and vessel personnel to effectively manage the changes which occur in the working environment, as well as enhancing the Company's safety and environmental performance.

DISTRIBUTION AND SERVICES

The Company, through its wholly owned subsidiary Kirby Distribution & Services, Inc. and its wholly owned subsidiaries Kirby Engine Systems LLC, (“Kirby Engine Systems”), Stewart & Stevenson LLC (“S&S”) and United Holdings LLC (“United”), and through Kirby Engine Systems’ wholly owned subsidiaries Marine Systems, Inc. (“Marine Systems”) and Engine Systems, Inc. (“Engine Systems”), serves two markets, oil and gas, and commercial and industrial. The Company sells genuine replacement parts, provides service mechanics to overhaul and repair engines, transmissions, reduction gears and related oilfield service equipment, rebuilds component parts or entire diesel engines, transmissions and reduction gears, and related equipment used in oilfield services, marine, mining, power generation, on-highway, and other commercial and industrial applications. The Company manufactures and remanufactures oilfield service equipment, including pressure pumping units, for North American as well international oilfield service companies, and oil and gas operator and producer markets. The Company also sells engines, transmissions, power generation systems, and rents equipment including generators, fork lifts, pumps, air compressors and railcar movers for use in a variety of commercial and industrial markets.

For the oil and gas market, the Company sells Original Equipment Manufacturers (OEM) replacement parts, sells and services diesel engines, pumps and transmissions, manufactures and remanufactures pressure pumping units, and manufactures cementing and pumping equipment, coil tubing and well intervention equipment, and gas compression equipment. Customers include oilfield service companies, and oil and gas operators and producers.

For the commercial and industrial market, the Company sells OEM replacement parts and new diesel engines, provides service mechanics and maintains facilities to overhaul and repair diesel engines and ancillary products for marine and on-highway transportation companies, mining and industrial companies. The Company provides engineering and field services, OEM replacement parts and safety-related products to power generation operators and to the nuclear industry, manufactures engine generator and pump packages for power generation operators and municipalities, offers power generation systems customized for specific commercial and industrial applications, and rents equipment including power generation systems, pumps, air compressors, fork lifts and railcar movers.

No single customer of the distribution and services segment accounted for 10% or more of the Company’s revenues in 2018, 2017 or 2016. The distribution and services segment also provides service to the Company’s marine transportation segment, which accounted for approximately 2% of the distribution and services segment’s 2018 and 2017 revenues and 8% of 2016 revenues. Such revenues are eliminated in consolidation and not included in the table below.

The following table sets forth the revenues for the distribution and services segment for the three years ended December 31, 2018 (dollars in thousands):

	2018		2017		2016	
	Amounts	%	Amounts	%	Amounts	%
Service and parts	\$ 1,059,270	71%	\$ 687,848	77%	\$ 295,603	99%
Manufacturing	428,284	29	202,464	23	3,177	1
	<u>\$ 1,487,554</u>	<u>100%</u>	<u>\$ 890,312</u>	<u>100%</u>	<u>\$ 298,780</u>	<u>100%</u>

Oil and Gas Operations

The Company is engaged in the distribution and service of high-speed diesel engines, pumps and transmissions, and the manufacture and remanufacture of oilfield service equipment. The oil and gas operations represented approximately 68% of the segment’s 2018 revenues. The Company offers custom fabricated oilfield service equipment, fully tested and field ready. The Company manufactures and remanufactures oilfield service equipment, including pressure pumping units, nitrogen pumping units, cementers, hydration equipment, mud pumps and blenders, coil tubing, well intervention equipment and gas compression equipment. The Company sells OEM replacement parts, and sells and services diesel engines, pumps and transmissions, and offers in-house and in-field service capabilities. The Company is the largest off-highway distributor for Allison Transmission and a major distributor for MTU in North America.

The Company’s manufacturing and remanufacturing facilities and service facilities are based in Houston, Texas and Oklahoma City, Oklahoma, key oil and gas producing regions.

Oil and Gas Customers

The Company's major oil and gas customers include large and mid-cap oilfield service providers, oil and gas operators and producers. The Company has long standing relationships with most of its customers. Since the oil and gas business is linked to the oilfield services industry, and oil and gas operators and producers, there is no assurance that its present gross revenues can be maintained in the future. The results of the Company's oil and gas distribution and services operations are largely tied to the industries it serves and, therefore, are influenced by the cycles of such industries.

Oil and Gas Competitive Conditions

The Company's primary competitors are other oilfield equipment manufacturers and remanufacturers, and equipment service companies. While price is a major determinant in the competitive process, equipment availability, reputation, consistent quality, expeditious service, experienced personnel, access to parts inventories and market presence are also significant factors. A substantial portion of the Company's business is obtained by competitive bids.

Commercial and Industrial Operations

The Company serves the marine, on-highway, mining, power generation, and other commercial and industrial markets primarily in the United States. The commercial and industrial operations represented approximately 32% of the segment's 2018 revenues.

The Company is engaged in the overhaul and repair of medium-speed and high-speed marine diesel engines and reduction gears, line boring, block welding services and related parts sales for customers in the marine industry. Medium-speed diesel engines have an engine speed of 400 to 1000 revolutions per minute ("RPM") with a horsepower range of 800 to 32000. High-speed diesel engines have an engine speed of over 1000 RPM and a horsepower range of 50 to 8375. The Company services medium-speed and high-speed diesel engines utilized in the inland and offshore barge industries. It also services marine equipment and offshore drilling equipment used in the offshore petroleum exploration and oil service industry, marine equipment used in the offshore commercial fishing industry, harbor docking vessels, commercial ferries, vessels owned by the United States government and large pleasure crafts.

The Company has marine operations throughout the United States providing in-house and in-field repair capabilities and related parts sales. The Company's emphasis is on service to its customers, and it sends its crews from any of its locations to service customers' equipment anywhere in the world. The medium-speed operations are located in Houma and Harvey, Louisiana, Houston, Texas, Chesapeake, Virginia, Paducah, Kentucky, Seattle, Washington and Tampa, Florida, serving as the authorized distributor for EMD Power Products ("EMD") throughout the United States. The Company is also a distributor and representative for certain Alfa Laval products in the Midwest and on the East Coast, Gulf Coast, and West Coast. All of the marine locations are authorized distributors for Falk Corporation reduction gears and Oil States Industries, Inc. clutches. The Chesapeake, Virginia operation concentrates on East Coast inland and offshore dry-bulk, tank barge and harbor docking operators, and the United States government. The Houma and Harvey, Louisiana and Houston, Texas operations concentrate on the inland and offshore barge and oil services industries. The Tampa, Florida operation concentrates on Gulf of Mexico offshore dry-bulk, tank barge and harbor docking operators. The Paducah, Kentucky operation concentrates on the inland river towboat and barge operators and the Great Lakes carriers. The Seattle, Washington operation concentrates on the offshore commercial fishing industry, the offshore barge industry, the United States government, and other customers in Alaska, Hawaii and the Pacific Rim.

The high-speed marine operations are located in Houston, Texas, Houma, Baton Rouge, Belle Chasse and New Iberia, Louisiana, Paducah, Kentucky, Mobile, Alabama, Lodi and Thorofare, New Jersey, and 10 locations in Florida. The Company serves as a factory-authorized marine dealer for Caterpillar diesel engines in multiple states. The Company also operates factory-authorized full service marine distributorships/dealerships for Cummins, Detroit Diesel, John Deere, MTU and Volvo Penta diesel engines, as well as Falk, Lufkin and Twin Disc marine gears. High-speed diesel engines provide the main propulsion for a significant amount of the United States flag commercial vessels and large pleasure craft vessels, other marine applications, including engines for power generators and barge pumps.

The Company distributes, sells parts for and services diesel engines and transmissions for on-highway use and provides in-house and in-field service capabilities. The Company is the largest on-highway distributor for Allison Transmission and Detroit Diesel/Daimler Truck North America, providing parts, service and warranty on engines, transmissions and related equipment in Arkansas, Colorado, Florida, Louisiana, New Mexico, New York, Oklahoma, Texas, Wyoming, and the country of Colombia. The Company also provides similar service for off-highway use and additionally has distributor rights for Deutz and Isuzu diesel engines. Off-highway applications are primarily surface and underground mining equipment, including loaders, crawlers, crushers, power screens, pumps, cranes, generators, haul trucks and personnel carriers, as well as the rental of equipment.

The Company is engaged in the overhaul and repair of diesel engines and generators, and related parts sales for power generation customers. The Company is also engaged in the sale and distribution of diesel engine parts, engine modifications, generator modifications, controls, governors and diesel generator packages to the nuclear industry. The Company services users of diesel engines that provide emergency standby, peak and base load power generation. The Company also sells power generation systems that are customized for specific applications and the rental of power generation systems.

The Company has power generation operations throughout the United States providing in-house and in-field repair capabilities and products for power generation applications. Through its Rocky Mount, North Carolina operation, the Company serves as the exclusive worldwide distributor of EMD products to the nuclear industry, the worldwide distributor for Woodward, Inc. products to the nuclear industry, the worldwide distributor of Baker Hughes, a GE Company (“Baker Hughes”) products to the nuclear industry, and owns the assets and technology necessary to support the Nordberg medium-speed diesel engines used in nuclear applications. In addition, the Rocky Mount operation is an exclusive distributor for Norlake Manufacturing Company transformer products to the nuclear industry, an exclusive distributor of Hannon Company generator and motor products to the nuclear industry, and a non-exclusive distributor of analog Weschler Instruments metering products and an exclusive distributor of digital Weschler metering products to the nuclear industry. The Company is a non-exclusive distributor of Ingersoll Rand air start equipment to the nuclear industry worldwide.

The Company sells pre-packaged and fabricated power generation systems for emergency, standby and auxiliary power for commercial and industrial applications. The Company also offers rental generator systems from MTU, Atlas Copco, and Multiquip from 50 to 2000 kilowatts of power to a broad range of customers. The Company also is engaged in the rental of power generator systems, fork lifts, pumps, air compressors and railcar movers. In addition, the Company provides accessory products such as cables, hoses, fuel cells, air dryers, air compressor boosters and ground heaters. Lastly, the Company is a dealer for Thermo King refrigeration systems for trucks, railroad cars and other land transportation markets in South and Central Texas.

Commercial and Industrial Customers

The Company’s major marine customers include inland and offshore barge operators, oil service companies, offshore fishing companies, other marine transportation entities, the United States government and large pleasure crafts. Since the marine business is linked to the relative health of the inland towboat, offshore and coastal tugboat, harbor docking tugboat, offshore oil service, oil and gas drilling, offshore commercial fishing industries, Great Lakes ore vessels, dredging vessels, coastal ferries, United States government vessels and the pleasure craft industry, there is no assurance that its present gross revenues can be maintained in the future. The results of the distribution and services industry are largely tied to the industries it serves and, therefore, are influenced by the cycles of such industries.

The Company’s on-highway customers are long-haul and short-haul trucking companies, commercial and industrial companies with truck fleets, buses owned by municipalities and private companies. Off-highway companies include surface and underground mining operations with a large variety of equipment.

The Company's power generation customers are domestic utilities and the worldwide nuclear power industry, municipalities, universities, medical facilities, data centers, petrochemical plants, manufacturing facilities, shopping malls, office complexes, residential and other industrial users.

The Company's rental customers are primarily commercial and industrial companies, and residential customers with short-term rental requirements.

Commercial and Industrial Competitive Conditions

The Company's primary marine competitors are independent distribution and services companies and other factory-authorized distributors, authorized service centers and authorized marine dealers. Certain operators of diesel powered marine equipment also elect to maintain in-house service capabilities. While price is a major determinant in the competitive process, reputation, consistent quality, expeditious service, experienced personnel, access to parts inventories and market presence are also significant factors. A substantial portion of the Company's business is obtained by competitive bids. However, the Company has entered into service agreements with certain operators of diesel powered marine equipment, providing such operators with one source of support and service for all of their requirements at pre-negotiated prices.

The Company is one of a limited number of authorized resellers of EMD, Caterpillar, Cummins, Detroit Diesel, John Deere, MTU and Volvo Penta parts. The Company is also the marine distributor for Falk, Lufkin and Twin Disc reduction gears throughout the United States.

The Company's primary power generation competitors are other independent diesel service companies and manufacturers. While price is a major determinant in the competitive process, reputation, consistent quality, expeditious service, experienced personnel, access to parts inventories and market presence are also significant factors. A substantial portion of the Company's business is obtained by competitive bids.

As noted above, the Company is the exclusive worldwide distributor of EMD, Baker Hughes, Woodward, Nordberg, Norlake and Hannon parts for the nuclear industry, and non-exclusive distributor of Weschler parts and Ingersoll Rand air start equipment for the nuclear industry. Specific regulations relating to equipment used in nuclear power generation require extensive testing and certification of replacement parts. OEM parts need to be properly tested and certified for nuclear applications.

Employees

The Company's distribution and services segment has approximately 2,500 employees. None of the United Holdings and Kirby Engine Systems operations are subject to collective bargaining agreements. Approximately 50 S&S employees in New Jersey are subject to a collective bargaining agreement with the Local 15C, International Union of Operating Engineers, AFL-CIO that expires in October 2023. The remaining S&S employees are not subject to collective bargaining agreements.

Properties

The principal office of the distribution and services segment is located in Houston, Texas. There are 63 active facilities in the distribution and services segment, with 29 of these facilities owned and 34 are leased facilities.

The oil and gas operation's principal manufacturing facilities are located in Houston, Texas and Oklahoma City, Oklahoma, with both facilities owned by the Company. The oil and gas focused operations have 21 parts and service facilities, with two in Arkansas, two in Colorado, four in Louisiana, one in New Mexico, one in Oklahoma, 10 in Texas and one in Wyoming, with many of these facilities shared with the commercial and industrial operations.

The commercial and industrial businesses operate 40 parts and service facilities, with one facility in Alabama, one in Connecticut, 11 in Florida, one in Kentucky, two in Louisiana, one in Massachusetts, one in Oklahoma, three in New Jersey, one in New York, one in North Carolina, 10 in Texas, one in Virginia, one in Washington and five facilities located in Colombia, South America.

Executive Officers of the Registrant

The executive officers of the Company are as follows:

Name	Age	Positions and Offices
David W. Grzebinski	57	President and Chief Executive Officer
William G. Harvey	61	Executive Vice President and Chief Financial Officer
Christian G. O'Neil	46	President – Kirby Inland Marine and Kirby Offshore Marine
Joseph H. Reniers	44	President – Kirby Distribution & Services, Inc.
Dorman L. Strahan	62	President – Kirby Engine Systems
Kim B. Clarke	63	Vice President and Chief Human Resources Officer
Ronald A. Dragg	55	Vice President, Controller and Assistant Secretary
Eric S. Holcomb	44	Vice President – Investor Relations
Amy D. Husted	50	Vice President and General Counsel
William M. Woodruff	58	Vice President – Public and Governmental Affairs
Renato A. Castro	47	Treasurer

No family relationship exists among the executive officers or among the executive officers and the directors. Officers are elected to hold office until the annual meeting of directors, which immediately follows the annual meeting of stockholders, or until their respective successors are elected and have qualified.

David W. Grzebinski is a Chartered Financial Analyst and holds a Master of Business Administration degree from Tulane University and a degree in chemical engineering from the University of South Florida. He has served as President and Chief Executive Officer since April 2014. He served as President and Chief Operating Officer from January 2014 to April 2014 and as Chief Financial Officer from March 2010 to April 2014. He served as Chairman of Kirby Offshore Marine from February 2012 to April 2013 and served as Executive Vice President from March 2010 to January 2014. Prior to joining the Company in February 2010, he served in various operational and financial positions since 1988 with FMC Technologies Inc. (“FMC”), including Controller, Energy Services, Treasurer, and Director of Global SAP and Industry Relations. Prior to joining FMC, he was employed by Dow Chemical Company in manufacturing, engineering and financial roles.

William G. Harvey is a Chartered Financial Analyst and holds a Master of Business Administration degree from the University of Toronto and a degree in mechanical engineering from Queens University. He has served as Executive Vice President and Chief Financial Officer since February 2018. He served as Executive Vice President – Finance from January 2018 to February 2018. Prior to joining the Company, Mr. Harvey served as Executive Vice President and Chief Financial Officer of Walter Energy, Inc. from 2012 to 2017, Senior Vice President and Chief Financial Officer of Resolute Forest Products Inc. (“Resolute”) from 2008 to 2011, and as Executive Vice President and Chief Financial Officer of Bowater Inc., a predecessor company of Resolute, from 2004 to 2008.

Christian G. O'Neil holds a Master of Business Administration degree from Rice University, a doctorate of jurisprudence from Tulane University and a bachelor of arts degree from Southern Methodist University. He has served as President of Kirby Inland Marine and Kirby Offshore Marine since January 2018. He served as Executive Vice President and Chief Operating Officer of Kirby Inland Marine and Kirby Offshore Marine from May 2016 to January 2018. He also served as Executive Vice President – Commercial Operations of Kirby Inland Marine and Kirby Offshore Marine from April 2014 to May 2016, Vice President – Human Resources of the Company from May 2012 to April 2014, Vice President – Sales for Kirby Inland Marine from 2009 to 2012 and President of Osprey from 2006 through 2008. He has also served in various sales and business development roles at the Company and Osprey. Prior to joining the Company, he served as Sales Manager and Fleet Manager at Hollywood Marine, Inc. (“Hollywood Marine”) after joining Hollywood Marine in 1997.

Joseph H. Reniers holds a degree in mechanical engineering from the United States Naval Academy and a Master of Business Administration degree from the University of Chicago Booth School of Business. He has served the Company as President – Kirby Distribution & Services, Inc. since September 2017. He served as Executive Vice President – Diesel Engine Services and Supply Chain from May 2016 to September 2017, Senior Vice President – Diesel Engine Services and Marine Facility Operations from February 2015 to May 2016, Vice President – Strategy and Operational Service from April 2014 to February 2015, Vice President – Supply Chain from April 2012 to April 2014 and Vice President – Human Resources from March 2010 to April 2012. Prior to joining the Company, he was a management consultant with McKinsey & Company serving a wide variety of industrial clients. Prior to joining McKinsey, he served as a nuclear power officer in the Navy.

Dorman L. Strahan attended Nicholls State University and has served the Company as President of Kirby Engine Systems since May 1999, President of Marine Systems since 1986 and President of Engine Systems since 1996. After joining the Company in 1982 in connection with the acquisition of Marine Systems, he served as Vice President of Marine Systems until 1985.

Kim B. Clarke holds a Bachelor of Science degree from the University of Houston. She has served as Vice President and Chief Human Resources Officer since October 2017. She served as Vice President – Human Resources from December 2016 to April 2017. Prior to joining the Company, she served in senior leadership roles in human resources, safety, information technology and business development as Senior Vice President and Chief Administration Officer for Key Energy Services, Inc. from 2004 to March 2016.

Ronald A. Dragg is a Certified Public Accountant and holds a Master of Science in Accountancy degree from the University of Houston and a degree in finance from Texas A&M University. He has served the Company as Vice President and Controller since January 2007. He also served as Controller from November 2002 to January 2007, Controller – Financial Reporting from January 1999 to October 2002, and Assistant Controller – Financial Reporting from October 1996 to December 1998. Prior to joining the Company, he was employed by Baker Hughes Incorporated.

Eric S. Holcomb is a Certified Public Accountant and holds a B.B.A. degree in accounting from Southern Methodist University. He has served the Company as Vice President – Investor Relations since December 2017. Prior to joining the Company, he was employed by Baker Hughes Incorporated from 2003 to December 2017 serving in various roles including Investor Relations Director, Finance Director for North America Land, Finance Director for North America Offshore and Finance Director for Canada.

Amy D. Husted holds a doctorate of jurisprudence from South Texas College of Law and a degree in political science from the University of Houston. She has served the Company as Vice President and General Counsel since January 2017. She served as Vice President – Legal from January 2008 to January 2017 and served as Corporate Counsel from November 1999 through December 2007. Prior to joining the Company, she served as Corporate Counsel of Hollywood Marine from 1996 to 1999 after joining Hollywood Marine in 1994.

William M. Woodruff holds a doctorate of jurisprudence from the University of Houston Law Center and a bachelor of science degree from Texas A&M University. He has served as Vice President – Public and Governmental Affairs since October 2017. He served as Director – Public & Government Affairs from 2014 to October 2017 after joining the Company as Director – Government Affairs in 2004. Prior to joining the Company, he was a maritime lawyer in private practice and Vice President and General Counsel of Coastal Towing, Inc.

Renato A. Castro is a Certified Public Accountant and holds a Master of Business Administration degree from Tulane University and a degree in civil engineering from the National Autonomous University of Honduras. He has served the Company as Treasurer since April 2010 and served as Manager of Financial Analysis from 2007 to April 2010. He also served as Financial Analyst from 2005 through 2006 and Assistant Controller of Kirby Inland Marine from 2001 through 2004. Prior to joining the Company, he was employed by a subsidiary of Astaldi S.p.A. in their transport infrastructure division.

Item 1A. Risk Factors

The following risk factors should be considered carefully when evaluating the Company, as its businesses, results of operations, or financial condition could be materially adversely affected by any of these risks. The following discussion does not attempt to cover factors, such as trends in the United States and global economies or the level of interest rates, among others, that are likely to affect most businesses.

The Inland Waterway infrastructure is aging and may result in increased costs and disruptions to the Company's marine transportation segment. Maintenance of the United States inland waterway system is vital to the Company's operations. The system is composed of over 12,000 miles of commercially navigable waterway, supported by over 240 locks and dams designed to provide flood control, maintain pool levels of water in certain areas of the country and facilitate navigation on the inland river system. The United States inland waterway infrastructure is aging, with more than half of the locks over 50 years old. As a result, due to the age of the locks, scheduled and unscheduled maintenance outages may be more frequent in nature, resulting in delays and additional operating expenses. One-half of the cost of new construction and major rehabilitation of locks and dams is paid by marine transportation companies through a 29 cent per gallon diesel fuel tax and the remaining 50% is paid from general federal tax revenues. Failure of the federal government to adequately fund infrastructure maintenance and improvements in the future would have a negative impact on the Company's ability to deliver products for its customers on a timely basis. In addition, any additional user taxes that may be imposed in the future to fund infrastructure improvements would increase the Company's operating expenses.

The Company is subject to adverse weather conditions in its marine transportation and distribution and services segments. The Company's marine transportation segment is subject to weather conditions on a daily basis. Adverse weather conditions such as high or low water on the inland waterway systems, fog and ice, tropical storms, hurricanes and tsunamis on both the inland waterway systems and throughout the United States coastal waters can impair the operating efficiencies of the marine fleet. Such adverse weather conditions can cause a delay, diversion or postponement of shipments of products and are totally beyond the control of the Company. In addition, adverse water and weather conditions can negatively affect a towing vessel's performance, tow size, loading drafts, fleet efficiency, place limitations on night passages and dictate horsepower requirements. The Company's distribution and services segment is subject to tropical storms and hurricanes impacting its coastal locations and tornadoes impacting its Oklahoma facilities.

The Company could be adversely impacted by a marine accident or spill event. A marine accident or spill event could close a portion of the inland waterway system or a coastal area of the United States for a period of time. Although statistically marine transportation is the safest means of surface transportation of bulk commodities, accidents do occur, both involving Company equipment and equipment owned by other marine carriers.

The Company transports a wide variety of petrochemicals, black oil, refined petroleum products and agricultural chemicals throughout the Mississippi River System, on the Gulf Intracoastal Waterway, coastwise along all three United States coasts and in Alaska and Hawaii. The Company manages its exposure to losses from potential discharges of pollutants through the use of well-maintained and equipped tank barges and towing vessels, through safety, training and environmental programs, and through the Company's insurance program, but a discharge of pollutants by the Company could have an adverse effect on the Company.

The Company's marine transportation segment is dependent on its ability to adequately crew its towing vessels. The Company's towing vessels are crewed with employees who are licensed or certified by the USCG, including its captains, pilots, engineers and tankermen. The success of the Company's marine transportation segment is dependent on the Company's ability to adequately crew its towing vessels. As a result, the Company invests significant resources in training its crews and providing crew members an opportunity to advance from a deckhand to the captain of a Company towboat or tugboat. Lifestyle issues are a deterrent for employment for inland and coastal crew members. Inland crew members generally work a 20 days on, 10 days off rotation, or a 30 days on, 15 days off rotation. For the coastal fleet, crew members are generally required to work a 14 days on, 14 days off, 21 days on, 21 days off or 30 days on, 30 days off rotation, dependent upon the location. With ongoing retirements and competitive labor pressure in the marine transportation segment, the Company continues to monitor and implement market competitive pay practices. The Company also utilizes an internal development program to train Maritime Academy graduates for vessel leadership positions.

The Company's marine transportation segment has approximately 3,050 employees, of which approximately 2,350 are vessel crew members. None of the segment's inland operations are subject to collective bargaining agreements. The segment's coastal operations include approximately 650 vessel employees, of whom approximately 400 are subject to collective bargaining agreements in certain geographic areas. Any work stoppages or labor disputes could adversely affect coastal operations in those areas.

The Company may be unable to make attractive acquisitions or successfully integrate acquired businesses, and any inability to do so may adversely affect the Company's business and hinder its ability to grow. The Company has made asset and business acquisitions in the past and may continue to make acquisitions of assets or businesses in the future that complement or expand the Company's current business. The Company may not be able to identify attractive acquisition opportunities. Even if attractive acquisition opportunities are identified, the Company may not be able to complete the acquisition or do so on commercially acceptable terms. The success of any completed acquisition depends on the Company's ability to integrate the acquired assets or business effectively into the Company's existing operations. The process of integrating acquired assets or businesses may involve difficulties that require a disproportionate amount of the Company's managerial and financial resources to resolve. The value of acquired assets or businesses may be negatively impacted by a variety of circumstances unknown to the Company prior to the acquisition. In addition, possible future acquisitions may be larger and for purchase prices significantly higher than those paid for earlier acquisitions. No assurance can be given that the Company will be able to identify additional suitable acquisition opportunities, negotiate acceptable terms, obtain financing for acquisitions on acceptable terms or successfully acquire identified targets. The Company's failure to achieve consolidation savings, to integrate successfully the acquired businesses and assets into the Company's existing operations, or to minimize any unforeseen operational difficulties could have a material adverse effect on the Company's business, financial condition, and results of operations. In addition, agreements governing the Company's indebtedness from time to time may impose certain limitations on the Company's ability to undertake acquisitions or make investments or may limit the Company's ability to incur certain indebtedness and liens, which could limit the Company's ability to make acquisitions.

The Company's failure to comply with the Foreign Corrupt Practices Act ("FCPA") could have a negative impact on its ongoing operations. The Company's operations outside the United States require the Company to comply with a number of United States and international regulations. For example, its operations in countries outside the United States are subject to the FCPA, which prohibits United States companies or their agents and employees from providing anything of value to a foreign official for the purposes of influencing any act or decision of these individuals in their official capacity to help obtain or retain business, direct business to any person or corporate entity, or obtain any unfair advantage. The Company has internal control policies and procedures and has implemented training and compliance programs for its employees and agents with respect to the FCPA. However, the Company's policies, procedures and programs may not always protect it from reckless or criminal acts committed by its employees or agents, and severe criminal or civil sanctions could be the result of violations of the FCPA. The Company is also subject to the risks that its employees, joint venture partners, and agents outside of the United States may fail to comply with other applicable laws.

The Company's marine transportation segment is subject to the Jones Act. The Company's marine transportation segment competes principally in markets subject to the Jones Act, a federal cabotage law that restricts domestic marine transportation in the United States to vessels built and registered in the United States, and manned and owned by United States citizens. The Company presently meets all of the requirements of the Jones Act for its vessels. The loss of Jones Act status could have a significant negative effect on the Company. The requirements that the Company's vessels be United States built and manned by United States citizens, the crewing requirements and material requirements of the USCG, and the application of United States labor and tax laws increases the cost of United States flag vessels when compared with comparable foreign flag vessels. The Company's business could be adversely affected if the Jones Act or international trade agreements or laws were to be modified as to permit foreign competition that is not subject to the same United States government imposed burdens. Since the events of September 11, 2001, the United States government has taken steps to increase security of United States ports, coastal waters and inland waterways. The Company believes that it is unlikely that the current cabotage provisions of the Jones Act would be modified or eliminated in the foreseeable future.

The Secretary of Homeland Security is vested with the authority and discretion to waive the Jones Act to such extent and upon such terms as the Secretary may prescribe whenever the Secretary deems that such action is necessary in the interest of national defense. On September 8, 2017, following Hurricanes Harvey and Irma, the Department of Homeland Security issued a waiver of the Jones Act for a 7-day period for shipments from New York, Pennsylvania, Texas and Louisiana to South Carolina, Georgia, Florida and Puerto Rico. The waiver was specifically tailored to address the transportation of refined petroleum products due to disruptions in hurricane-affected areas. On September 11, 2017, the waiver was extended for 11 days and expanded to include additional states. Following Hurricane Maria, on September 28, 2017, the Department of Homeland Security issued a waiver of the Jones Act for movement of products shipped from United States coastwise points to Puerto Rico through October 18, 2017. Waivers of the Jones Act, whether in response to natural disasters or otherwise, could result in increased competition from foreign tank vessel operators, which could negatively impact the marine transportation segment.

The Company's marine transportation segment is subject to regulation by the USCG, federal laws, state laws and certain international conventions, as well as numerous environmental regulations. The majority of the Company's vessels are subject to inspection by the USCG and carry certificates of inspection. The crews employed by the Company aboard vessels are licensed or certified by the USCG. The Company is required by various governmental agencies to obtain licenses, certificates and permits for its vessels. The Company's operations are also affected by various United States and state regulations and legislation enacted for protection of the environment. The Company incurs significant expenses and capital expenditures to comply with applicable laws and regulations and any significant new regulation or legislation, including climate change laws or regulations, could have an adverse effect on the Company.

The Company is subject to risks associated with possible climate change legislation, regulation and international accords. Greenhouse gas emissions have increasingly become the subject of a large amount of international, national, regional, state and local attention. On December 7, 2009, the EPA furthered its focus on greenhouse gas emissions when it issued its endangerment finding in response to a decision of the Supreme Court of the United States. The EPA found that the emission of six greenhouse gases, including carbon dioxide (which is emitted from the combustion of fossil fuels), may reasonably be anticipated to endanger public health and welfare. Based on this finding, the EPA defined the mix of these six greenhouse gases to be "air pollution" subject to regulation under the Clean Air Act. Although the EPA has stated a preference that greenhouse gas regulation be based on new federal legislation rather than the existing Clean Air Act, many sources of greenhouse gas emissions may be regulated without the need for further legislation.

The United States Congress has considered in the past legislation that would create an economy-wide "cap-and-trade" system that would establish a limit (or cap) on overall greenhouse gas emissions and create a market for the purchase and sale of emissions permits or "allowances." Any proposed cap-and-trade legislation would likely affect the chemical industry due to anticipated increases in energy costs as fuel providers pass on the cost of the emissions allowances, which they would be required to obtain under cap-and-trade to cover the emissions from fuel production and the eventual use of fuel by the Company or its energy suppliers. In addition, cap-and-trade proposals would likely increase the cost of energy, including purchases of diesel fuel, steam and electricity, and certain raw materials used or transported by the Company. Proposed domestic and international cap-and-trade systems could materially increase raw material and operating costs of the Company's customer base. Future environmental regulatory developments related to climate change in the United States that restrict emissions of greenhouse gases could result in financial impacts on the Company's operations that cannot be predicted with certainty at this time.

The Company's marine transportation segment is subject to volatility in the United States production of petrochemicals. For 2018, 56% of the marine transportation segment's revenues were from the movement of petrochemicals, including the movement of raw materials and feedstocks from one refinery or petrochemical plant to another, as well as the movement of more finished products to end users and terminals for export. During 2018, petrochemical volumes were relatively stable compared with 2017 and 2016. The United States petrochemical industry continues to benefit from a low-cost domestically produced natural gas feedstock advantage, producing strong volumes of raw materials and intermediate products for transportation between Gulf Coast petrochemical plants and the transportation of more finished products to terminals for both domestic consumers and for export destinations. In addition, approximately 20 new United States petrochemical projects, including expansion of existing plants or new plants, are scheduled to be completed during 2019 and 2020 which should provide additional movements for the marine transportation segment. Higher natural gas prices and other factors could negatively impact the United States petrochemical industry and its production volumes, which would negatively impact the Company.

The Company's marine transportation segment could be adversely impacted by the construction of tank barges by its competitors. At the present time, there are an estimated 3,800 inland tank barges in the United States, of which the Company operates 1,003, or 26%. The number of tank barges peaked at an estimated 4,200 in 1982, slowly declined to 2,750 by 2003, and then gradually increased to an estimated 3,850 by the end of 2015 and 2016 and slightly decreased to an estimated 3,825 at the end of 2017 and an estimated 3,800 at the end of 2018. The Company estimates that industry-wide approximately 100 tank barges were placed in service during 2016, of which five were by the Company, and 100 tank barges were retired, 50 of which were by the Company. The Company estimates that industry-wide 75 tank barges were placed in service during 2017, of which five were by the Company, and 100 tank barges were retired, 54 of which were by the Company. For 2018, the Company estimated that industry-wide 75 tank barges were placed in service, of which one was by the Company, and 100 tank barges were retired, 48 of which were by the Company. The increase for 2015 reflected the improved demand for inland petrochemical, refined petroleum products and black oil barges experienced in 2014 and federal tax incentives on new equipment. The decrease in the number of tank barges at the end of 2017 and 2018 was primarily due to continued industry-wide tank barge retirements and minimal new tank barge construction. The Company estimates that approximately 150 tank barges have been ordered during 2018 for delivery throughout 2019 and many older tank barges, including an expected eight by the Company, will be retired, dependent on 2019 market conditions.

The long-term risk of an oversupply of inland tank barges may be mitigated by the fact that the inland tank barge industry has approximately 400 tank barges that are over 30 years old and approximately 240 of those over 40 years old. Given the age profile of the industry inland tank barge fleet, the expectation is that older tank barges will continue to be removed from service and replaced by new tank barges as needed, with the extent of both retirements and new builds dependent on petrochemical and refinery production levels and crude oil and natural gas condensate movements, both of which can have a direct effect on industry-wide tank barge utilization, as well as term and spot contract rates.

During 2016, 2017 and 2018, a decline in industry-wide demand for the movement of crude oil and natural gas condensate transportation volumes increased available capacity and resulted in some reluctance among certain customers to extend term contracts, which led to an increase in the number of coastal vessels operating in the spot market. In addition, the Company and the industry added new coastal tank barge capacity during 2016, 2017 and 2018, with additional new capacity coming on-line in 2019. Much of this new capacity is replacement capacity for older vessels anticipated to be retired.

The Company estimates there are approximately 290 tank barges operating in the 195,000 barrel or less coastal industry fleet, the sector of the market in which the Company operates, and approximately 15 of those are over 30 years old. In June 2018, the Company purchased a 155,000 barrel coastal ATB under construction from another operator that was delivered to the Company in the 2018 fourth quarter. The Company is aware of nine coastal tank barge and tugboat units placed in service in 2016, seven in 2017 and, three in 2018 by competitors. There are currently three announced coastal tank barge and tugboat units under construction by competitors for delivery in 2019. There are also two coastal ATB units greater than 195,000 barrels that are under construction by a competitor that are expected to be delivered in 2020.

Higher fuel prices could increase operating expenses and fuel price volatility could reduce profitability. The cost of fuel during 2018 was approximately 11% of marine transportation revenue. All marine transportation term contracts contain fuel escalation clauses, or the customer pays for the fuel. However, there is generally a 30 to 90 day delay before contracts are adjusted depending on the specific contract. In general, the fuel escalation clauses are effective over the long-term in allowing the Company to adjust to changes in fuel costs due to fuel price changes; however, the short-term effectiveness of the fuel escalation clauses can be affected by a number of factors including, but not limited to, specific terms of the fuel escalation formulas, fuel price volatility, navigating conditions, tow sizes, trip routing, and the location of loading and discharge ports that may result in the Company over or under recovering its fuel costs. Spot contract rates generally reflect current fuel prices at the time the contract is signed but do not have escalators for fuel.

Loss of a large customer or other significant business relationship could adversely affect the Company. Four marine transportation customers accounted for approximately 15% of the Company's 2018, 20% of 2017 and 25% of 2016 revenue. The Company has contracts with these customers expiring in 2019 through 2022. Two distribution and services customers accounted for approximately 13% of the Company's 2018 and 2017 revenue and 3% of 2016 revenue. Although the Company considers its relationships with these companies to be strong, the loss of any of these customers could have an adverse effect on the Company.

The Company's distribution and services segment has a 53-year relationship with EMD, the largest manufacturer of medium-speed diesel engines. The Company, through Kirby Engine Systems, serves as both an EMD distributor and service center for select markets and locations for both service and parts. With the acquisition of S&S in September 2017, the Company added additional EMD exclusive distributorship rights in key states, primarily through the Central, South and Eastern areas of the United States. With the S&S acquisition, the Company became the United States distributor for EMD marine and power generation applications. Sales and service of EMD products account for approximately 3% of the Company's revenues for 2018. Although the Company considers its relationship with EMD to be strong, the loss of the EMD distributorship and service rights, or a disruption of the supply of EMD parts, could have a negative impact on the Company's ability to service its customers.

United and S&S have maintained continuous exclusive distribution rights for MTU and Allison since the 1940s. United and S&S are two of MTU's top five distributors of off-highway engines in North America, with exclusive distribution rights in multiple states. In addition, as distributors of Allison products, United and S&S have exclusive distribution rights in multiple key growth states. United and S&S are also the distributor for parts, service and warranty on Daimler truck engines and related equipment in multiple states. Sales and service of MTU and Allison products accounted for approximately 19% of the Company's revenues during 2018. Although the Company considers its relationships with MTU and Allison to be strong, the loss of MTU, Allison or Daimler distributorships and service rights, or a disruption of the supply of MTU or Allison parts, could have a negative impact on the Company's ability to service its customers.

The Company is subject to competition in both its marine transportation and distribution and services segments. The inland and coastal tank barge industry remains very competitive. The Company's primary competitors are noncaptive inland tank barge operators and coastal operators. The Company also competes with companies who operate refined product and petrochemical pipelines, railroad tank cars and tractor-trailer tank trucks. Increased competition from any significant expansion of or additions to facilities or equipment by the Company's competitors could have a negative impact on the Company's results of operations.

The distribution and services industry is also very competitive. The segment's oil and gas market's principal competitors are independent distribution and service and oilfield manufacturing companies and other factory-authorized distributors and service centers. In addition, certain oilfield service companies that are customers of the Company also manufacture and service a portion of their own oilfield equipment. Increased competition in the distribution and services industry and continued low price of natural gas, crude oil or natural gas condensate, and resulting decline in drilling for such natural resources in North American shale formations, could result in less oilfield equipment being manufactured and remanufactured, lower rates for service and parts pricing and result in less manufacturing, remanufacturing, service and repair opportunities and parts sales for the Company. For the commercial and industrial market, the segment's primary marine diesel competitors are independent diesel services companies and other factory-authorized distributors, authorized service centers and authorized marine dealers. Certain operators of diesel powered marine equipment also elect to maintain in-house service capabilities. For power generation, the primary competitors are other independent service companies.

Significant increases in the construction cost of tank barges and towing vessels may limit the Company's ability to earn an adequate return on its investment in new tank barges and towing vessels. The price of steel increased significantly from 2006 to 2009, thereby increasing the construction cost of new tank barges and towing vessels. The Company's average construction price for a new 30,000 barrel capacity inland tank barge ordered in 2008 for 2009 delivery was approximately 90% higher than in 2000, primarily due to the increase in steel prices. During 2009, the United States and global recession negatively impacted demand levels for inland tank barges and as a result, the construction price of inland tank barges for 2010 delivery fell significantly, primarily due to a significant decrease in steel prices, as well as a decrease in the number of tank barges ordered. The average construction price for inland tank barges delivered since 2010 steadily increased until reaching its peak in early 2015, but remained below the construction price for tank barges delivered in 2009. Construction costs for inland tank barges ordered in 2016 for delivery in 2017 and ordered in 2017 for delivery in 2018 have remained below 2015 levels, reflecting the industry-wide over-capacity in the inland tank barge market and the subsequent decline in the number of tank barges ordered for delivery in 2017 and 2018.

The Company's marine transportation segment could be adversely impacted by the failure of the Company's shipyard vendors to deliver new vessels according to contractually agreed delivery schedules and terms. The Company contracts with shipyards to build new vessels and currently has many vessels under construction. Construction projects are subject to risks of delay and cost overruns, resulting from shortages of equipment, materials and skilled labor; lack of shipyard availability; unforeseen design and engineering problems; work stoppages; weather interference; unanticipated cost increases; unscheduled delays in the delivery of material and equipment; and financial and other difficulties at shipyards including labor disputes, shipyard insolvency and inability to obtain necessary certifications and approvals. A significant delay in the construction of new vessels or a shipyard's inability to perform under the construction contract could negatively impact the Company's ability to fulfill contract commitments and to realize timely revenues with respect to vessels under construction. Significant cost overruns or delays for vessels under construction could also adversely affect the Company's financial condition, results of operations and cash flows.

The Company's distribution and services segment could be adversely impacted by future legislation or additional regulation of hydraulic fracturing practices. The Company, through its United and S & S subsidiaries, is a distributor and service provider of engine and transmission related products for the oil and gas services, power generation and transportation industries, and a manufacturer of oilfield service equipment, including pressure pumping units. The EPA is studying hydraulic fracturing practices, and legislation may be introduced in Congress that would authorize the EPA to impose additional regulations on hydraulic fracturing. In addition, a number of states have adopted or are evaluating the adoption of legislation or regulations governing hydraulic fracturing. Such federal or state legislation and/or regulations could materially impact customers' operations and greatly reduce or eliminate demand for the Company's pressure pumping fracturing equipment and related products. The Company is unable to predict whether future legislation or any other regulations will ultimately be enacted and, if so, the impact on the Company's distribution and services segment.

The Company relies on critical information systems for the operation of its businesses, and the failure of any critical information system, including a cyber-security breach, may adversely impact its businesses. The Company is dependent on its technology infrastructure and must maintain and rely upon critical information systems for the effective and safe operation of its businesses. These information systems include software applications and hardware equipment, as well as data networks and telecommunications.

The Company's information systems, including the Company's proprietary vessel management computer system, are subject to damage or interruption from a number of potential sources, including but not limited to, natural disasters, software viruses, power failures and cyber-attacks. The Company has implemented measures such as emergency recovery processes, virus protection software, intrusion detection systems and annual attack and penetration audits to mitigate these risks. However, the Company cannot guarantee that its information systems cannot be damaged or compromised.

Any damage or compromise of its data security or its inability to use or access these critical information systems could adversely impact the efficient and safe operation of its businesses, or result in the failure to maintain the confidentiality of data of its customers or its employees and could subject the Company to increased operating expenses or legal action, which could have an adverse effect on the Company.

Prevailing natural gas and crude oil prices, as well as the volatility of their prices, could have an adverse effect on the Company's businesses. Demand for tank barge transportation services is driven by the production of volumes of the bulk liquid commodities such as petrochemicals, black oil and refined petroleum products that the Company transports by tank barge. This production can depend on the prevailing level of natural gas and crude oil prices, as well as the volatility of their prices.

In general, lower energy prices are good for the United States economy and typically translate into increased petrochemical and refined product demand and therefore increased demand for tank barge transportation services. However, during 2016 and 2017 lower crude oil prices resulted in a decline in domestic crude oil and natural gas condensate production and reduced volumes to be transported by tank barge. The Company estimates that at the beginning of 2015 there were approximately 550 inland tank barges and 35 coastal tank barges in the 195,000 barrels or less category transporting crude oil and natural gas condensate. At the end of 2016, the Company estimated that approximately 140 inland tank barges and approximately ten coastal tank barges in the 195,000 barrel or less category were transporting such products, a reduction of approximately 410 inland tank barges and 25 coastal tank barges that have moved into other markets. At the end of 2017, the Company estimated that approximately 250 inland tank barges and approximately three coastal tank barges were transporting crude and natural gas condensate. As of the end of 2018, the Company estimates that approximately 375 inland tank barges and approximately three coastal tank barges were transporting crude and natural gas condensate. Volatility in the price of natural gas and crude oil can also result in heightened uncertainty which may lead to decreased production and delays in new petrochemical and refinery plant construction. Increased competition for available black oil and petrochemical barge moves caused by reduced crude oil and natural gas condensate production could have an adverse impact on the Company's marine transportation segment.

Lower energy prices generally result in a decrease in the number of oil and gas wells being drilled. Oilfield service companies reduce their capital spending, resulting in decreased demand for new parts and equipment, including pressure pumping units, provided by the Company's distribution and services segment. This may also lead to order cancellations from customers or customers requesting to delay delivery of new equipment. The Company also services offshore supply vessels and offshore drillings rigs operating in the Gulf of Mexico, as well as internationally. Low energy prices may negatively impact the number of wells drilled in the Gulf of Mexico and international waters. In addition to the possibility that decreased energy prices may result in reduced demand for the Company's services, parts and equipment, energy price volatility may also result in difficulties in the Company's ability to ramp up and ramp down production on a timely basis and, therefore, could result in an adverse impact on the Company's distribution and services segment.

The Company's distribution and services segment could be adversely impacted by the construction of pressure pumping units by its competitors. In early 2015, an estimated 21.0 million horsepower of pressure pumping units were working, or available to work, in North America. By late 2016, the working horsepower in North America had declined to an estimated 6.0 million, with an estimated 2.0 million horsepower scrapped, an estimated 2.0 million horsepower available for work and an estimated 12.5 million horsepower stacked, the large majority of which would require major service before being placed back in service. A significant drop in demand due to the low price of crude oil resulted in an oversupply in the pressure pumping market and negatively impacted the Company's 2015 and 2016 results of operations. During late 2016 and 2017 and 2018, with the stabilization of crude oil prices in the \$40 to \$70 per barrel range, the United States land rig count improved and service intensity in the well completion business increased. As a result, the Company experienced a healthy rebound in service demand, particularly with pressure pumping unit remanufacturing and transmission overhauls, and with the acquisition of S&S in September 2017, the manufacture of oilfield service equipment, including pressure pumping units, and the sale of transmissions. At the end of 2018, an estimated 16.0 million horsepower of pressure pumping units were working in North America, with an estimated 4.5 million horsepower available to work, and 5.5 million horsepower stacked and in need of major repair. Increased expansion of, or additions to, facilities or equipment by the Company's competitors could have a negative impact on the Company's results of operations.

Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

The information appearing in Item 1 under “Marine Transportation– Properties” and “Distribution and Services– Properties” is incorporated herein by reference. The Company believes that its facilities are adequate for its needs and additional facilities would be available if required.

Item 3. Legal Proceedings

In 2009, the Company was named a Potentially Responsible Party (“PRP”) in addition to a group of approximately 250 named PRPs under the Comprehensive Environmental Response, Compensation and Liability Act of 1981 (“CERCLA”) with respect to a Superfund site, the Portland Harbor Superfund site (“Portland Harbor”) in Portland, Oregon. The site was declared a Superfund site in December 2000 as a result of historical heavily industrialized use due to manufacturing, shipbuilding, petroleum storage and distribution, metals salvaging, and electrical power generation activities which led to contamination of Portland Harbor, an urban and industrial reach of the lower Willamette River located immediately downstream of downtown Portland. The Company’s involvement arises from four spills at the site after it was declared a Superfund site, as a result of predecessor entities’ actions in the area. To date, there is no information suggesting the extent of the costs or damages to be claimed from the 250 notified PRPs. Based on the nature of the involvement at the Portland Harbor site, the Company believes its potential contribution is de minimis; however, to date neither the EPA nor the named PRPs have performed an allocation of potential liability in connection with the site nor have they provided costs and expenses in connection with the site.

In January 2015, the Company was named as a defendant in a Complaint filed in the U.S. District Court of the Southern District of Texas, *USOR Site PRP Group vs. A&M Contractors, USES, Inc. et al.* This is a civil action pursuant to the provisions of CERCLA and the Texas Solid Waste Disposal Act for recovery of past and future response costs incurred and to be incurred by the USOR Site PRP Group for response activities at the U.S. Oil Recovery Superfund Site. The property was a former sewage treatment plant owned by defendant City of Pasadena, Texas from approximately 1945 until it was acquired by U.S. Oil Recovery in January 2009. Throughout its operating life, the U.S. Oil Recovery facility portion of the USOR Site received and performed wastewater pretreatment of municipal and Industrial Class I and Class II wastewater, characteristically hazardous waste, used oil and oily sludges, and municipal solid waste. Associated operations were conducted at the MCC Recycling facility portion of the USOR Site after it was acquired by U.S. Oil Recovery from the City of Pasadena in January 2009. The EPA and the PRP Group entered into an Administrative Settlement Agreement and Order for Remedial Investigation Study (“Study”) in May 2015. The Study has not been completed by EPA to date. The Company filed responsive pleadings in this matter. Based on the nature of the involvement at the USOR Site, the Company believes its potential contribution is de minimis; however, the Study and further review of the Company’s activities at the Site remains ongoing.

On October 13, 2016, the Company, as a successor to Hollywood Marine, was issued a General Notice under CERCLA in which it was named as a PRP for liabilities associated with the SBA Shipyard Site located near Jennings, Louisiana (“Site”). The Site was added to the EPA’s National Priorities List of sites under CERCLA in September 2016. SBA used the facility for construction, repair, retrofitting, sandblasting, and cleaning and painting of barges beginning in 1965. Three barge slips and a dry dock are located off the Mermentau River. The slips were used to dock barges during cleaning or repair. In 2001, a group of PRPs that had been former customers of the SBA Shipyard facility formed an organization called the SSIC Remediation, LLC (hereinafter, “the PRP Group Companies”) to address removal actions at the Site. In 2002, EPA approved an Interim Measures/Removal Action of Hazardous/Principal Threat Wastes at SBA Shipyards, Inc. (pursuant to RCRA Section 3008(h)) that was proposed by SBA Shipyard and the PRP Group Companies. Interim removal activities were conducted from March 2001 through January 2005 under an EPA 2002 Order and Agreement. In September 2012, the Louisiana Department of Environmental Quality requested EPA address the Site under CERCLA authority. The Company, as a successor to Hollywood Marine, joined the PRP Group Companies. The PRP Group Companies have submitted a draft Study work plan to EPA for their review and comment. Higman Marine, Inc. and its affiliated companies (“Higman”) was named as a PRP in connection with its activities at the Site. Higman is not a participant in the PRP Group Companies.

With respect to the above sites, the Company has recorded reserves, if applicable, for its estimated potential liability for its portion of the EPA's past costs claim based on information developed to date including various factors such as the Company's liability in proportion to other responsible parties and the extent to which such costs are recoverable from third parties.

On October 13, 2016, the tug Nathan E. Stewart and barge DBL 55, an ATB, ran aground at the entrance to Seaforth Channel on Atholone Island, British Columbia. The grounding resulted in a breach of a portion of the Nathan E. Stewart's fuel tanks causing a discharge of diesel fuel into the water. The USCG and the National Transportation Safety Board designated the Company as a party of interest in their investigation as to the cause of the incident. The Canadian authorities including Transport Canada and the Canadian Transportation Safety Board investigated the cause of the incident. On October 10, 2018, the Heiltsuk First Nation filed a civil action against a subsidiary of the Company, the master and pilot of the tug, the vessels and the Canadian government seeking unquantified damages as a result of the incident. On the same date, the Canadian government filed charges against the subsidiary and the vessels for violations of the Canadian Fisheries Act, the Migratory Birds Convention Act, the Pilotage Act and the Shipping Act of 2001. To date, there has been no activity in either pending case as deadlines to respond have been extended. The Company is unable to estimate the potential exposure in either proceeding. The Company has various insurance policies covering liabilities including pollution, property, marine and general liability and believes that it has satisfactory insurance coverage for the cost of cleanup and salvage operations as well as other potential liabilities arising from the incident. The Company believes it has accrued adequate reserves for the incident and does not expect the incident to have a material adverse effect on its business or financial condition.

On March 22, 2014, two tank barges and a towboat (the M/V Miss Susan), owned by Kirby Inland Marine, LP, a wholly owned subsidiary of the Company, were involved in a collision with the M/S Summer Wind on the Houston Ship Channel near Texas City, Texas. The lead tank barge was damaged in the collision resulting in a discharge of intermediate fuel oil from one of its cargo tanks. The Company is participating in the natural resource damage assessment and restoration process with federal and state government natural resource trustees. The Company believes it has adequate insurance coverage for pollution, marine and other potential liabilities arising from the incident. The Company believes it has accrued adequate reserves for the incident and does not expect the incident to have a material adverse effect on its business or financial condition.

In addition, the Company is involved in various legal and other proceedings which are incidental to the conduct of its business, none of which in the opinion of management will have a material effect on the Company's financial condition, results of operations or cash flows. Management believes that it has recorded adequate reserves and believes that it has adequate insurance coverage or has meritorious defenses for these other claims and contingencies.

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

The Company's common stock is traded on the New York Stock Exchange under the symbol KEX. The following table sets forth the high and low sales prices per share for the common stock for the periods indicated:

	Sales Price	
	High	Low
2019		
First Quarter (through February 22, 2019)	\$ 78.86	\$ 65.24
2018		
First Quarter	80.90	66.80
Second Quarter	94.05	76.20
Third Quarter	88.80	75.70
Fourth Quarter	86.12	60.63
2017		
First Quarter	73.40	61.65
Second Quarter	74.50	62.55
Third Quarter	68.60	59.25
Fourth Quarter	72.95	61.80

As of February 22, 2019, the Company had 59,875,000 outstanding shares held by approximately 580 stockholders of record; however, the Company believes the number of beneficial owners of common stock exceeds this number.

The Company does not have an established dividend policy. Decisions regarding the payment of future dividends will be made by the Board of Directors based on the facts and circumstances that exist at that time. Since 1989, the Company has not paid any dividends on its common stock. The Company's credit agreements contain covenants restricting the payment of dividends by the Company at any time when there is a default under the agreements.

Item 6. Selected Financial Data

The comparative selected financial data of the Company and consolidated subsidiaries is presented for the five years ended December 31, 2018. The information should be read in conjunction with Management's Discussion and Analysis of Financial Condition and Results of Operations of the Company in Item 7 and the Financial Statements included under Item 8 (selected financial data in thousands, except per share amounts).

	December 31,				
	2018	2017	2016	2015	2014
Revenues:					
Marine transportation	\$ 1,483,143	\$ 1,324,106	\$ 1,471,893	\$ 1,663,090	\$ 1,770,684
Distribution and services	1,487,554	890,312	298,780	484,442	795,634
	<u>\$ 2,970,697</u>	<u>\$ 2,214,418</u>	<u>\$ 1,770,673</u>	<u>\$ 2,147,532</u>	<u>\$ 2,566,318</u>
Net earnings attributable to Kirby	<u>\$ 78,452</u>	<u>\$ 313,187</u>	<u>\$ 141,406</u>	<u>\$ 226,684</u>	<u>\$ 282,006</u>
Net earnings per share attributable to Kirby common stockholders:					
Basic	<u>\$ 1.31</u>	<u>\$ 5.62</u>	<u>\$ 2.63</u>	<u>\$ 4.12</u>	<u>\$ 4.95</u>
Diluted	<u>\$ 1.31</u>	<u>\$ 5.62</u>	<u>\$ 2.62</u>	<u>\$ 4.11</u>	<u>\$ 4.93</u>
Common stock outstanding:					
Basic	59,557	55,308	53,454	54,729	56,674
Diluted	59,689	55,361	53,512	54,826	56,867

	December 31,				
	2018	2017	2016	2015	2014
Property and equipment, net	\$ 3,539,802	\$ 2,959,265	\$ 2,921,374	\$ 2,778,980	\$ 2,589,498
Total assets	\$ 5,871,594	\$ 5,127,427	\$ 4,289,895	\$ 4,140,558	\$ 4,127,052
Long-term debt, including current portion	\$ 1,410,188	\$ 992,406	\$ 722,802	\$ 774,849	\$ 712,405
Total equity	\$ 3,216,301	\$ 3,114,223	\$ 2,412,867	\$ 2,279,196	\$ 2,264,913

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

Statements contained in this Form 10-K that are not historical facts, including, but not limited to, any projections contained herein, are forward-looking statements and involve a number of risks and uncertainties. Such statements can be identified by the use of forward-looking terminology such as “may,” “will,” “expect,” “anticipate,” “estimate,” or “continue,” or the negative thereof or other variations thereon or comparable terminology. The actual results of the future events described in such forward-looking statements in this Form 10-K could differ materially from those stated in such forward-looking statements. Among the factors that could cause actual results to differ materially are: adverse economic conditions, industry competition and other competitive factors, adverse weather conditions such as high water, low water, tropical storms, hurricanes, tsunamis, fog and ice, tornados, marine accidents, lock delays, fuel costs, interest rates, construction of new equipment by competitors, government and environmental laws and regulations, and the timing, magnitude and number of acquisitions made by the Company. For a more detailed discussion of factors that could cause actual results to differ from those presented in forward-looking statements, see Item 1A-Risk Factors. Forward-looking statements are based on currently available information and the Company assumes no obligation to update any such statements.

For purposes of Management's Discussion, all net earnings per share attributable to Kirby common stockholders are “diluted earnings per share.” The weighted average number of common shares outstanding applicable to diluted earnings per share for 2018, 2017 and 2016 were 59,689,000, 55,361,000 and 53,512,000, respectively. The increase in the weighted average number of common shares for 2018 compared with 2017 and 2016 primarily reflects the issuance of 5,696,259 shares of common stock associated with the acquisition of S&S on September 13, 2017 and the issuance of restricted stock and the exercise of stock options.

Overview

The Company is the nation's largest domestic tank barge operator, transporting bulk liquid products throughout the Mississippi River System, on the Gulf Intracoastal Waterway, coastwise along all three United States coasts, and in Alaska and Hawaii. The Company transports petrochemicals, black oil, refined petroleum products and agricultural chemicals by tank barge. As of December 31, 2018, the Company operated a fleet of 1,003 inland tank barges with 21.8 million barrels of capacity, and operated an average of 278 inland towboats during 2018. The Company's coastal fleet consisted of 53 tank barges with 5.1 million barrels of capacity and 50 coastal tugboats. The Company also owns and operates four offshore dry-bulk cargo barges, four offshore tugboats and one docking tugboat transporting dry-bulk commodities in United States coastal trade. Through its distribution and services segment, the Company provides after-market service and parts for engines, transmissions, reduction gears, and related equipment used in oilfield services, marine, mining, power generation, on-highway, and other industrial applications. The Company also rents equipment including generators, fork lifts, pumps and compressors for use in a variety of industrial markets, and manufactures and remanufactures oilfield service equipment, including pressure pumping units, for the oilfield service and oil and gas operator and producer markets.

For 2018, net earnings attributable to Kirby were \$78,452,000, or \$1.31 per share, on revenues of \$2,970,697,000, compared with 2017 net earnings attributable to Kirby of \$313,187,000, or \$5.62 per share, on revenues of \$2,214,418,000. The 2018 year reflected the integration of Targa Resources Corp.'s ("Targa") pressure barge fleet, acquired on May 10, 2018, and the integration of Higman, acquired on February 14, 2018. The 2018 fourth quarter included \$85,108,000 before taxes, \$67,235,000 after taxes, or \$1.12 per share, non-cash impairment of long-lived assets and lease cancellation costs and \$2,702,000 before taxes, \$2,135,000 after taxes, or \$0.04 per share, non-cash impairment of goodwill. The 2018 second quarter included a one-time non-deductible expense of \$18,057,000, or \$0.30 per share, related to the retirement of Joseph H. Pyne as executive Chairman of the Board of Directors, effective April 30, 2018. The 2018 first quarter included \$3,261,000 before taxes, or \$0.04 per share, of one-time transaction costs associated with the Higman acquisition, as well as \$2,912,000 before taxes, or \$0.04 per share, of severance and retirement expenses, primarily related to cost reduction initiatives in the coastal marine transportation market and the integration of Higman. In addition, the 2018 first quarter included \$3,938,000 before taxes, or \$0.05 per share, of non-cash expenses related to an amendment to the employee stock award plan. The result of the amendment is shorter expense accrual periods on stock options and Restricted Stock Units ("RSUs") granted after February 19, 2018 to employees who are nearing retirement and meet certain years of service and age requirements. The 2017 year included \$269,472,000 after taxes, or \$4.83 per share, of deferred tax revaluation benefit, the result of recent federal tax reform legislation that resulted in the remeasurement of the Company's United States deferred tax assets and liabilities. This was partially offset by \$105,712,000 before taxes, \$66,975,000 after taxes, or \$1.20 per share, non-cash impairment of long-lived assets and \$5,449,000 before taxes, \$3,389,000 after taxes, or \$0.06 per share, charge for severance and early workforce retirements.

Marine Transportation

For 2018, 50% of the Company's revenues were generated by its marine transportation segment. The segment's customers include many of the major petrochemical and refining companies that operate in the United States. Products transported include intermediate materials used to produce many of the end products used widely by businesses and consumers — plastics, fiber, paints, detergents, oil additives and paper, among others, as well as residual fuel oil, ship bunkers, asphalt, gasoline, diesel fuel, heating oil, crude oil, natural gas condensate and agricultural chemicals. Consequently, the Company's marine transportation business is directly affected by the volumes produced by the Company's petroleum, petrochemical and refining customer base.

The Company's marine transportation segment's revenues for 2018 increased 12% when compared with 2017. The increase was primarily due to the addition of the Higman inland tank barges acquired on February 14, 2018 and the Targa pressure barges acquired on May 10, 2018, and improved barge utilization and spot contract pricing in the inland market. Partially offsetting the increase were lower term and spot contract pricing in the coastal market, poor seasonal weather conditions in the first four months and fourth quarter of 2018, lock closures in the 2018 second half and fewer coastal tank barges available with the impairment and retirement of 12 tank barges in the 2017 fourth quarter. The segment's operating income for 2018 increased 9% compared with 2017 primarily due to the acquisitions of Higman and Targa's pressure barge fleet, improved term and spot contract pricing in the inland market, and improved barge utilization in the inland market. These improvements were partially offset by lower coastal term and spot contract pricing, poor seasonal weather conditions in the first four months and fourth quarter of 2018 and lock closures in the 2018 second half. Operating income for 2018 was also impacted by the Higman transaction costs, severance and retirement costs, and the amendment to the employee stock award plan; all of which were incurred in the 2018 first quarter and are discussed above. For 2018 and 2017, the inland tank barge fleet contributed 76% and 70%, respectively, and the coastal fleet contributed 24% and 30%, respectively, of marine transportation revenues.

Inland marine transportation equipment utilization was in the mid-90% range during the 2018 first quarter, high 80% to low 90% during the second quarter, and the low to mid-90% range during the third and fourth quarters. Increased customer demand and poor seasonal operating conditions contributed to a tight market across the entire inland tank barge industry during 2018. Operating conditions were adversely impacted by high water conditions on the Mississippi River early in the 2018 second quarter, however, weather conditions improved in May and June, enhancing operating efficiency but driving seasonally lower utilization compared to the 2018 first quarter. Increasing volumes from petrochemical and black oil customers, lock infrastructure projects in Louisiana as well as on the Ohio River, and refinery turnarounds contributed to increased utilization during the 2018 second half compared to the 2018 first half. For 2017, utilization ranged from high 80% to low 90% during the 2017 first quarter, mid-80% to high 80% during the second quarter, mid-80% to mid-90% during the third quarter and low to mid-90% during the fourth quarter.

Coastal tank barge utilization levels improved throughout 2018 from the high 70% range during the 2018 first quarter to the 80% range by end of 2018. The improvement in utilization primarily reflected the impairment and retirement of 12 out-of-service coastal barges during the 2017 fourth quarter. Utilization in the coastal marine fleet continued to be impacted by the oversupply of tank barges in the coastal industry. Coastal utilization had declined throughout 2017 as new tank barges were placed in service by the Company and competitors, further adding to the overcapacity in the coastal market and further increasing the number of coastal tank barges operating in the spot market, which added increased idle time and voyage costs. In 2017, equipment utilization was in the mid-70% to low 80% range during the first quarter, high 60% to mid-70% range during the second quarter, and low 60% to mid-60% during the third and fourth quarters.

During 2018, approximately 65% of the inland marine transportation revenues were under term contracts and 35% were spot contract revenues. For 2017, approximately 75% of inland marine transportation revenues were under term contracts and 25% were spot contract revenues. These allocations provide the operations with a more predictable revenue stream. Inland time charters, which insulate the Company from revenue fluctuations caused by weather and navigational delays and temporary market declines, represented 59% of the inland revenues under term contracts during 2018 compared with 49% during 2017. Rates on inland term contracts renewed in the 2018 first quarter decreased in the 4% to 6% average range compared with term contracts renewed in the first quarter of 2017. Rates on inland term contracts renewed in the 2018 second quarter increased in the 1% to 3% average range compared with term contracts renewed in the second quarter of 2017. In the 2018 third quarter, rates on inland term contracts renewed increased in the 3% to 5% average range compared with term contracts renewed in the third quarter of 2017. In the 2018 fourth quarter, rates on inland term contracts were generally higher in the 1% to 3% average range, though some multi-year contracts did renew lower, compared with term contracts renewed in the fourth quarter of 2017. Spot contract rates, which include the cost of fuel, increased in the 10% to 15% range in the 2018 first and second quarters compared with the 2017 first and second quarters. In the 2018 third and fourth quarters, spot contract rates increased in the 20% to 25% range compared with the 2017 third and fourth quarters. Effective January 1, 2018, annual escalators for labor and the producer price index on a number of inland multi-year contracts resulted in rate increases on those contracts of approximately 1.0%, excluding fuel.

During 2018 and 2017, approximately 80% of the coastal revenues were under term contracts and 20% were spot contract revenues. Coastal time charters represented approximately 85% of coastal revenues under term contracts during 2018 and 2017. Spot and term contract pricing, which are contingent on various factors including geographic location, vessel capacity, vessel type and product serviced, were stable throughout the 2018 first and second quarters compared with pricing in the 2017 fourth quarter, and moved modestly higher in the 2018 third and fourth quarters. In the 2018 first and second quarters, both term and spot contract pricing declined in the 10% to 15% range compared to the 2017 first and second quarters. Compared to the 2017 third quarter, spot market pricing in the 2018 third quarter was similar but term contract pricing increased modestly. Compared to the 2017 fourth quarter, spot market pricing in the 2018 fourth quarter was approximately 10% higher and term contract pricing increased modestly.

The 2018 marine transportation operating margin was 9.9% compared with 10.2% for 2017.

Distribution and Services

During 2018, the distribution and services segment generated 50% of the Company's revenues, of which 71% was generated from service and parts and 29% from manufacturing. The results of the distribution and services segment are largely influenced by the economic cycles of the oilfield service and oil and gas operator and producer markets, marine, mining, power generation, on-highway and other industrial markets.

Distribution and services revenues for 2018 increased 67% when compared with 2017. Operating income for 2018 increased 50% when compared with 2017. The higher revenues and operating income were primarily attributable to the acquisition of S&S, completed on September 13, 2017, as well as increased demand in the oil and gas market for the manufacturing of oilfield service equipment, including new pressure pumping units, the sale and distribution of engines and related parts, and improving market conditions in the commercial marine diesel engine repair business, partially offset by lower demand in the 2018 second half for new and overhauled transmissions and related parts and remanufactured pressure pumping units from some key oilfield customers. For 2018, the oil and gas market contributed approximately 68% of the distribution and services revenues. The increased demand challenged the Company's vendor supply chain in 2018 and created delays for the delivery of new engines, transmissions and parts required for the completion of both new and remanufactured oilfield service equipment, including pressure pumping units, and impacted the recognition of revenue. However, the supply chain issues were largely resolved during the 2018 fourth quarter resulting in a sequential increase in the number of new and remanufactured pressure pumping units delivered in the fourth quarter. In the commercial and industrial market, approximately 32% of the distribution and services revenues for 2018, the marine sector experienced higher service levels for diesel engine service and related parts sales throughout 2018. The power generation sector saw increased demand from commercial customers for specialty rental units and back-up power systems in the 2018 second and third quarters in anticipation of and as a result of summer storms. Demand for standby-by power generation equipment declined in the 2018 fourth quarter compared to the 2017 fourth quarter which had experienced higher levels of activity during the 2017 hurricane season. Demand in the nuclear power generation market was stable compared to 2017.

The distribution and services operating margin for 2018 was 8.7% compared with 9.7% for 2017.

Cash Flow and Capital Expenditures

The Company continued to generate favorable operating cash flow during 2018 with net cash provided by operating activities of \$346,999,000 compared with \$353,378,000 of net cash provided by operating activities for 2017, a 2% decrease. The largest component contributing to the \$6,379,000 decrease was the net decrease in cash flows from the change in operating assets and liabilities of \$65,436,000. Excluding the net decrease in cash flows from the change in operating assets and liabilities, the net cash provided by operating activities improvement was driven by an increase in revenues and operating income in both the marine transportation and distribution and services segments driven by the acquisitions of Higman in February 2018 and S&S in September 2017 as well as improved inland barge pricing and utilization in 2018 in the marine transportation segment and increased demand for the manufacturing of oilfield service equipment, including new pressure pumping units, in the distribution and services segment.

The decrease in cash flows from the change in operating assets and liabilities of \$65,436,000 in 2018 as compared to 2017 was primarily due to higher inventories, including work in process, in the distribution and services oil and gas market during 2018, primarily to support the increased business activity levels, partially offset by a decrease in trade receivables due to a decrease in revenues recognized in the distribution and services oil and gas market in the 2018 fourth quarter driven by lower demand for new and overhauled transmissions and related parts and remanufacturing pressure pumping units from some key oilfield customers. In addition, during 2018 and 2017, the Company generated cash of \$53,392,000 and \$54,229,000, respectively, from proceeds from the disposition of assets, and \$13,264,000 and \$3,039,000, respectively, from proceeds from the exercise of stock options.

For 2018, cash generated and borrowings under the Company's revolving credit facility were used for capital expenditures of \$301,861,000, including \$26,172,000 for inland tank barge and towboat construction, \$41,653,000 for progress payments on six 5000 horsepower coastal ATB tugboats, \$71,660,000 for a 155,000 barrel coastal ATB under construction purchased from another operator that was delivered to the Company in the 2018 fourth quarter, and \$162,376,000 primarily for upgrading existing marine equipment and marine transportation and distribution and services facilities. The Company also used \$533,897,000 for acquisitions of businesses and marine equipment.

The Company's debt-to-capitalization ratio increased to 30.5% at December 31, 2018 from 24.2% at December 31, 2017, primarily due to the issuance of \$500,000,000 of 4.2% senior unsecured notes due March 1, 2028 (the "2028 Notes") to purchase Higman in the 2018 first quarter and borrowings under the Company's revolving credit facility for the acquisition of Targa's pressure barge fleet, the purchase of the 155,000 barrel coastal ATB under construction in the 2018 second quarter and the acquisition of 27 inland tank barges from CGBM 100, LLC ("CGBM") in the 2018 fourth quarter, and the offset by the increase in total equity from net earnings attributable to Kirby in 2018 of \$78,452,000, the exercise of stock options, the amortization of unearned equity compensation and cash generated during the year. As of December 31, 2018, the Company had \$417,373,000 outstanding under its Revolving Credit Facility, \$500,000,000 of senior notes outstanding and \$500,000,000 of the 2028 Notes outstanding, offset by \$7,204,000 in unamortized debt discount and issuance costs.

During 2018, the Company took delivery of one new inland tank barge with a capacity of approximately 29,000 barrels, acquired 163 inland tank barges with the Higman acquisition with a total capacity of approximately 4,766,000 barrels, acquired 27 inland tank barges from CGBM with a total capacity of approximately 306,000 barrels, acquired 16 pressure barges from Targa with a total capacity of approximately 258,000 barrels, acquired two inland tank barges with a total capacity of approximately 35,000 barrels, chartered one inland tank barge with a capacity of approximately 11,000 barrels, and retired 48 inland tank barges, reducing its capacity by approximately 846,000 barrels. The net result was an increase of 162 inland tank barges and approximately 4,559,000 barrels of capacity during 2018.

The Company projects that capital expenditures for 2019 will be in the \$225,000,000 to \$245,000,000 range. The 2019 construction program will consist of progress payments on the construction of 15 inland towboats, eight of which will be placed in service in 2019 and the remaining seven in 2020, and progress payments on the construction of three 5000 horsepower coastal ATB tugboats to be placed in service in 2019. Based on current commitments, steel prices and projected delivery schedules, the Company's 2019 progress payments on the new inland towboats will be approximately \$27,000,000 and 2019 progress payments on the construction of the three 5000 horsepower coastal ATB tugboats will be approximately \$18,000,000. Approximately \$155,000,000 to \$165,000,000 is primarily capital upgrades and improvements to existing marine equipment and facilities. The balance of \$25,000,000 to \$35,000,000 will be for rental fleet growth, new machinery and equipment, and facilities improvements in the distribution and services segment.

Outlook

In the inland marine transportation market, the Company anticipates favorable market dynamics with continued growth in customer demand during 2019, driven by continued growth in U.S. GDP, new petrochemical plants which are expected to come on-line during the year, and new pipelines from the Permian Basin that will bring additional crude oil volumes to the Gulf Coast. These factors, combined with only modest inland barge additions, are expected to result in inland barge utilization rates in the low to mid-90% range during the year. Together with a full year of contribution from 2018 acquisitions, including Higman, Targa's pressure barge business, and CGBM's tank barges, as well as the recently announced pending acquisition of Cenac Marine Services LLC's fleet, inland revenues and operating income are expected to increase during 2019.

As of December 31, 2018, the Company estimated there were approximately 3,800 inland tank barges in the industry fleet, of which approximately 400 were over 30 years old and approximately 240 of those over 40 years old. The Company estimates that approximately 150 tank barges were ordered during 2018 for delivery throughout 2019 and many older tank barges, including an expected eight by the Company, will be retired, dependent on 2019 market conditions. Historically, 75 to 150 older inland tank barges are retired from service each year industry-wide, with the extent of the retirements dependent on petrochemical and refinery production levels, and crude oil and natural gas condensate movements, both of which can have a direct effect on industry-wide tank barge utilization, as well as term and spot contract rates.

In the coastal marine transportation market, the Company expects revenues and operating income to improve as compared to 2018, with coastal tank barge utilization increasing modestly into the low to mid-80% range for 2019. Improving market conditions are expected to be driven by stable to slightly improving customer demand and expected additional industry retirements of aging barges due to BWMS regulations. The Company expects pricing to increase modestly with low to mid-single digit improvement on most renewing term contracts and spot market rates as industry utilization improves.

As of December 31, 2018, the Company estimated there were approximately 290 tank barges operating in the 195,000 barrel or less coastal industry fleet, the sector of the market in which the Company operates, and approximately 15 of those were over 30 years old. In June 2018, the Company purchased a 155,000 barrel coastal ATB under construction from another operator that was delivered to the Company in the 2018 fourth quarter. The Company is aware of three announced coastal tank barge and tugboat units in the 195,000 barrel or less category under construction by competitors for delivery in 2019, and two coastal tank barge and tugboat units greater than 195,000 barrels under construction for delivery in 2020.

The results of the distribution and services segment are largely influenced by the economic cycles of the land-based oilfield service and oil and gas operator and producer markets, marine, mining, power generation, on-highway and other industrial markets.

Recent oilfield activity declines and crude oil price volatility in the 2018 fourth quarter are expected to result in lower distribution sales and service of engines, new and overhauled transmissions and associated parts in 2019. In manufacturing, however, the current backlog for new and remanufactured pressure pumping units and equipment should provide stable activity levels through the first half of 2019. Continuing demand for pressure pumping unit remanufacturing and service, international projects and efficient and environmentally friendly pressure pumping equipment is expected to continue into the second half of 2019.

For the distribution and services commercial and industrial market, the Company anticipates revenues and operating income to increase in 2019 with higher anticipated demand for standby power generation and specialty equipment rentals. Activity in the nuclear standby power generation market and the commercial marine markets is expected to be stable in 2019.

Critical Accounting Policies and Estimates

The preparation of financial statements in conformity with United States generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. The Company evaluates its estimates and assumptions on an ongoing basis based on a combination of historical information and various other assumptions that are believed to be reasonable under the particular circumstances. Actual results may differ from these estimates based on different assumptions or conditions. The Company believes the critical accounting policies that most impact the consolidated financial statements are described below. It is also suggested that the Company's significant accounting policies, as described in the Company's financial statements in Note 1, Summary of Significant Accounting Policies, be read in conjunction with this Management's Discussion and Analysis of Financial Condition and Results of Operations.

Accounts Receivable. The Company extends credit to its customers in the normal course of business. The Company regularly reviews its accounts and estimates the amount of uncollectible receivables each period and establishes an allowance for uncollectible amounts. The amount of the allowance is based on the age of unpaid amounts, information about the current financial strength of customers, and other relevant information. Estimates of uncollectible amounts are revised each period, and changes are recorded in the period they become known. Historically, credit risk with respect to these trade receivables has generally been considered minimal because of the financial strength of the Company's customers; however, a United States or global recession or other adverse economic condition could impact the collectability of certain customers' trade receivables which could have a material effect on the Company's results of operations.

Property, Maintenance and Repairs. Property is recorded at cost. Improvements and betterments are capitalized as incurred. Depreciation is recorded on the straight-line method over the estimated useful lives of the individual assets. When property items are retired, sold or otherwise disposed of, the related cost and accumulated depreciation are removed from the accounts with any gain or loss on the disposition included in the statement of earnings. Maintenance and repairs on vessels built for use on the inland waterways are charged to operating expense as incurred and includes the costs incurred in USCG inspections unless the shipyard extends the life or improves the operating capacity of the vessel which results in the costs being capitalized. The Company's ocean-going vessels are subject to regulatory drydocking requirements after certain periods of time to be inspected, have planned major maintenance performed and be recertified by the ABS. These recertifications generally occur twice in a five year period. The Company defers the drydocking expenditures incurred on its ocean-going vessels due to regulatory marine inspections by the ABS and amortizes the costs of the shipyard over the period between drydockings, generally 30 or 60 months, depending on the type of major maintenance performed. Drydocking expenditures that extend the life or improve the operating capability of the vessel result in the costs being capitalized. Routine repairs and maintenance on ocean-going vessels are expensed as incurred. Interest is capitalized on the construction of new ocean-going vessels.

The Company reviews long-lived assets for impairment by vessel class whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. Recoverability of the assets is measured by a comparison of the carrying amount of the assets to future net cash expected to be generated by the assets. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value of the assets. Assets to be disposed of are reported at the lower of the carrying amount or fair value less costs to sell. There are many assumptions and estimates underlying the determination of an impairment event or loss, if any. The assumptions and estimates include, but are not limited to, estimated fair market value of the assets and estimated future cash flows expected to be generated by these assets, which are based on additional assumptions such as asset utilization, length of service the asset will be used, and estimated salvage values. Although the Company believes its assumptions and estimates are reasonable, deviations from the assumptions and estimates could produce a materially different result.

Goodwill. The excess of the purchase price over the fair value of identifiable net assets acquired in transactions accounted for as a purchase is included in goodwill. Management monitors the recoverability of goodwill on an annual basis, or whenever events or circumstances indicate that interim impairment testing is necessary. The amount of goodwill impairment, if any, is typically measured based on projected discounted future operating cash flows using an appropriate discount rate. The assessment of the recoverability of goodwill will be impacted if estimated future operating cash flows are not achieved. There are many assumptions and estimates underlying the determination of an impairment event or loss, if any. Although the Company believes its assumptions and estimates are reasonable, deviations from the assumptions and estimates could produce a materially different result.

Accrued Insurance. The Company is subject to property damage and casualty risks associated with operating vessels carrying large volumes of bulk liquid and dry cargo in a marine environment. The Company maintains insurance coverage against these risks subject to a deductible, below which the Company is liable. In addition to expensing claims below the deductible amount as incurred, the Company also maintains a reserve for losses that may have occurred but have not been reported to the Company, or are not yet fully developed. The Company uses historic experience and actuarial analysis by outside consultants to estimate an appropriate level of reserves. If the actual number of claims and magnitude were substantially greater than assumed, the required level of reserves for claims incurred but not reported or fully developed could be materially understated. The Company records receivables from its insurers for incurred claims above the Company's deductible. If the solvency of the insurers became impaired, there could be an adverse impact on the accrued receivables and the availability of insurance.

Acquisitions

On January 29, 2019, the Company signed a definitive agreement to acquire the marine transportation fleet of Cenac for approximately \$244,000,000 in cash, subject to certain closing adjustments. Cenac's fleet consists of 63 inland 30,000 barrel tank barges with approximately 1.9 million barrels of capacity, 34 inland towboats and two offshore tugboats. Cenac moves petrochemicals, refined products and black oil, including crude oil, residual fuels, feedstocks and lubricants on the lower Mississippi River, its tributaries, and the Gulf Intracoastal Waterway for major oil companies and refiners. On February 11, 2019, the Federal Trade Commission granted the Company early termination of the Hart-Scott-Rodino waiting period for the acquisition of Cenac. The closing of the acquisition is expected to occur in March 2019. Financing of the acquisition will be through additional borrowings.

On December 28, 2018, the Company purchased three inland tank barges from a leasing company for \$3,120,000 in cash. The Company had been leasing the barges prior to the purchase. Financing of the equipment acquisition was through borrowings under the Company's revolving credit facility.

On December 14, 2018, the Company purchased 27 inland tank barges with a barrel capacity of 306,000 barrels from CGBM for \$28,500,000 in cash. The 27 tank barges transport petrochemicals and refined products on the Mississippi River System and the Gulf Intracoastal Waterway. The average age of the barges was eight years. Financing of the equipment acquisition was through borrowings under the Company's revolving credit facility.

On November 30, 2018, the Company purchased an inland towboat from a leasing company for \$3,050,000 in cash. The Company had been leasing the towboat prior to the purchase. Financing of the equipment acquisition was through borrowings under the Company's revolving credit facility.

On May 10, 2018, the Company completed the purchase of Targa's inland tank barge business from a subsidiary of Targa for \$69,250,000 in cash. Targa's inland tank barge fleet consisted of 16 pressure barges with a total capacity of 258,000 barrels, many of which were under multi-year contracts that the Company assumed from Targa. The 16 tank barges transport petrochemicals on the Mississippi River System and the Gulf Intracoastal Waterway. Financing of the business acquisition was through borrowings under the Company's revolving credit facility.

On March 15, 2018, the Company purchased two inland pressure tank barges from a competitor for \$10,400,000 in cash. The average age of the two tank barges was five years. Financing of the equipment acquisition was through borrowings under the Company's revolving credit facility.

On February 14, 2018, the Company completed the acquisition of Higman for \$421,922,000 in cash, subject to certain post-closing adjustments. Higman's fleet consisted of 163 inland tank barges with 4.8 million barrels of capacity, and 75 inland towboats, transporting petrochemicals, black oil, including crude oil and natural gas condensate, and refined petroleum products on the Mississippi River System and the Gulf Intracoastal Waterway. The average age of the inland tank barges was approximately seven years and the inland towboats had an average age of approximately eight years. Financing of the acquisition was through the issuance of the 2028 Notes. The 2028 Notes were issued on February 12, 2018 in preparation for closing of the acquisition.

On October 20, 2017, San Jac, a subsidiary of the Company, purchased certain assets of Sneed Shipbuilding, Inc. for \$14,852,000 in cash including its Channelview, Texas shipyard. San Jac is a builder of marine vessels for both inland and offshore applications as well providing repair and maintenance services. The Company intends to build towboats at the shipyard and use the facilities for routine maintenance. Financing of the acquisition was through borrowings under the Company's revolving credit facility.

On September 13, 2017, the Company completed the acquisition of substantially all of the assets of S&S, a global manufacturer and distributor of products and services for the oil and gas, marine, construction, power generation, transportation, mining and agricultural industries. The acquired business, which the Company operates through a newly formed subsidiary renamed Stewart & Stevenson LLC after the closing of the acquisition, was founded in 1902 and serves domestic and global markets with equipment, rental solutions, parts and service through a strategic network of sales and service centers in domestic and international locations.

The total value of the transaction was \$758,213,000 consisting of cash consideration of \$377,935,000, the assumption of \$13,724,000 of debt and \$366,554,000 through the issuance of 5,696,259 shares of Company common stock valued at \$64.35 per share, the Company's closing share price on September 13, 2017. The debt assumed consisted of \$12,135,000 of term debt and \$1,589,000 of short-term secured loans related to the Company's South American operations. The term debt was paid off without penalty in the 2017 fourth quarter. Financing of the acquisition was through a combination of the Company's revolving credit facility and the issuance of Company common stock.

S&S, headquartered in Houston, Texas with 40 branches across 12 states, is a distributor in certain geographic areas for Allison Transmission, MTU, Detroit Diesel, EMD, Deutz and several other manufacturers. S&S' principal customers are oilfield service companies, oil and gas operators and producers, and companies in the marine, mining, power generation, on-highway and other commercial and industrial applications.

On July 10, 2017, the Company completed the purchase of certain inland marine assets from an undisclosed competitor for \$68,000,000 in cash. The assets purchased consisted of nine specialty pressure tank barges, four 30,000 barrel tank barges and three 1320 horsepower inland towboats. The average age of the 13 inland tank barges was five years. The 13 tank barges transport petrochemicals and refined petroleum products on the Mississippi River System and the Gulf Intracoastal Waterway. Financing of the equipment acquisition was through borrowings under the Company's revolving credit facility.

During July 2017, the Company purchased four inland tank barges for \$1,450,000, as well as a barge fleet and marine fueling operation business in Freeport, Texas for \$3,900,000. The Company had been leasing the barges prior to the purchase. Financing of the acquisitions was through the Company's revolving credit facility.

On October 11, 2016, the Company purchased certain assets of Valley Power Systems, Inc. and Valley Power Systems Northwest, Inc. (collectively "VPS") for \$11,440,000 in cash. The assets purchased are mainly related to the EMD engine supply and repair business of VPS and include an EMD distributor agreement to sell engines in nine western states. Financing of the acquisition was through the Company's revolving credit facility.

On June 30, 2016, the Company purchased an 80,000 barrel coastal tank barge from TD Equipment Finance, Inc. ("TD Equipment") for \$13,682,000 in cash. The Company had been leasing the barge from TD Equipment prior to its purchase. Financing of the equipment acquisition was through the Company's revolving credit facility.

On June 2, 2016, the Company purchased four coastal tugboats from Crosby Marine Transportation LLC for \$26,450,000 in cash. The four coastal tugboats have an average age of 13 years. Financing of the equipment acquisition was through borrowings under the Company's revolving credit facility.

On April 15, 2016, the Company purchased the inland tank barge fleet of SEACOR Holdings Inc. ("Seacor") from subsidiaries of Seacor for a total value of \$89,181,000. The assets purchased consisted of 27 inland 30,000 barrel tank barges and 14 inland towboats. The purchase price was comprised of \$85,500,000 in cash and the transfer to Seacor of a Florida-based ship docking tugboat with a value of \$3,681,000. The average age of the 27 inland tank barges was ten years. Seacor, through its subsidiary, SCF Waxler Marine LLC, transported refined petroleum products, petrochemicals and black oil on the Mississippi River System and the Gulf Intracoastal Waterway. Financing of the acquisition was through the Company's revolving credit facility.

Results of Operations

The Company reported 2018 net earnings attributable to Kirby of \$78,452,000, or \$1.31 per share, on revenues of \$2,970,697,000, compared with 2017 net earnings attributable to Kirby of \$313,187,000, or \$5.62 per share, on revenues of \$2,214,418,000, and 2016 net earnings attributable to Kirby of \$141,406,000, or \$2.62 per share, on revenues of \$1,770,673,000.

Marine transportation revenues for 2018 were \$1,483,143,000, or 50% of total revenues, compared with \$1,324,106,000, or 60% of total revenues for 2017, and \$1,471,893,000, or 83% of total revenues for 2016. Distribution and services revenues for 2018 were \$1,487,554,000, or 50% of total revenues, compared with \$890,312,000, or 40% of total revenues for 2017, and \$298,780,000, or 17% of total revenues for 2016.

The 2018 year reflected the integration of Targa's pressure barge fleet, acquired on May 10, 2018, and the integration of Higman, acquired on February 14, 2018. The 2018 fourth quarter included \$85,108,000 before taxes, \$67,235,000 after taxes, or \$1.12 per share, non-cash impairment of long-lived assets and lease cancellation costs and \$2,702,000 before taxes, \$2,135,000 after taxes, or \$0.04 per share, non-cash impairment of goodwill. The 2018 second quarter included a one-time non-deductible expense of \$18,057,000, or \$0.30 per share, related to the retirement of Joseph H. Pyne as executive Chairman of the Board of Directors, effective April 30, 2018. The 2018 first quarter included \$3,261,000 before taxes, or \$0.04 per share, of one-time transaction costs associated with the Higman acquisition, as well as \$2,912,000 before taxes, or \$0.04 per share, of severance and retirement expenses, primarily related to cost reduction initiatives in the coastal marine transportation market and the integration of Higman. In addition, the 2018 first quarter included \$3,938,000 before taxes, or \$0.05 per share, of non-cash expenses related to an amendment to the employee stock award plan. The result of the amendment is shorter expense accrual periods on stock options and RSUs granted after February 19, 2018 to employees who are nearing retirement and meet certain years of service and age requirements.

The 2017 year included \$269,472,000 after taxes, or \$4.83 per share, of deferred tax benefit, the result of recent federal tax reform legislation that resulted in the remeasurement of the Company's United States deferred tax assets and liabilities. This was partially offset by \$105,712,000 before taxes, \$66,975,000 after taxes, or \$1.20 per share, non-cash impairment of long-lived assets and \$5,449,000 before taxes, \$3,389,000 after taxes, or \$0.06 per share, charge for severance and early workforce retirements.

The 2017 results reflect the acquisition of S&S on September 13, 2017. The 2017 results were negatively impacted by S&S acquisition related costs of \$2,119,000, or \$0.02 per share. The 2017 third quarter also included an estimated net \$0.03 per share negative impact of Hurricane Harvey, which made landfall along the Texas Gulf Coast in late August 2017, impacting the marine transportation and distribution and services operations, and Hurricane Irma, which disrupted the coastal marine transportation and distribution and services operations along the East Coast.

The 2016 first quarter results included \$5,605,000 before taxes, or \$0.06 per share, of severance charges which were reflected in the marine transportation and distribution and services businesses and corporate staff in order to reduce costs.

Marine Transportation

The Company, through its marine transportation segment, is a provider of marine transportation services, operating tank barges and towing vessels transporting bulk liquid products throughout the Mississippi River System, on the Gulf Intracoastal Waterway, coastwise along all three United States coasts, and in Alaska and Hawaii. The Company transports petrochemicals, black oil, refined petroleum products and agricultural chemicals by tank barge. As of December 31, 2018, the Company operated 1,003 inland tank barges, including 31 leased barges, with a total capacity of 21.8 million barrels. This compares with 841 inland tank barges operated as of December 31, 2017, including 31 leased barges, with a total capacity of 17.3 million barrels. The Company operated an average of 278 inland towboats during 2018, of which an average of 77 were chartered, compared with 224 during 2017, of which an average of 70 were chartered. The Company's coastal tank barge fleet as of December 31, 2018 consisted of 53 tank barges, including four of which were leased, with 5.1 million barrels of capacity, and 50 coastal tugboats, four of which were chartered. This compares with 56 coastal tank barges operated as of December 31, 2017, seven of which were leased, with 5.4 million barrels of capacity, and 53 coastal tugboats, five of which were chartered. As of December 31, 2018, the Company owned four offshore dry-bulk cargo barge and tugboat units engaged in the offshore transportation of dry-bulk cargoes. This compares with five offshore dry-bulk cargo barge and tugboat units owned as of December 31, 2017. The Company also owns shifting operations and fleeting facilities for dry cargo barges and tank barges on the Houston Ship Channel and in Freeport, Texas, a shipyard for building towboats and performing routine maintenance near the Houston Ship Channel, as well as a two-thirds interest in Osprey, which transports project cargoes and cargo containers by barge.

The following table sets forth the Company's marine transportation segment's revenues, costs and expenses, operating income and operating margins for the three years ended December 31, 2018 (dollars in thousands):

	2018	2017	% Change 2017 to 2018	2016	% Change 2016 to 2017
Marine transportation revenues	\$ 1,483,143	\$ 1,324,106	12%	\$ 1,471,893	(10)%
Costs and expenses:					
Costs of sales and operating expenses	997,979	867,069	15	898,404	(3)
Selling, general and administrative	122,421	116,827	5	108,928	7
Taxes, other than on income	33,020	25,765	28	20,817	24
Depreciation and amortization	182,307	178,898	2	184,291	(3)
	<u>1,335,727</u>	<u>1,188,559</u>	<u>12</u>	<u>1,212,440</u>	<u>(2)</u>
Operating income	\$ 147,416	\$ 135,547	9%	\$ 259,453	(48)%
Operating margins	<u>9.9%</u>	<u>10.2%</u>		<u>17.6%</u>	

The following table shows the marine transportation markets serviced by the Company, the marine transportation revenue distribution for 2018, products moved and the drivers of the demand for the products the Company transports:

Markets Served	2018 Revenue Distribution	Products Moved	Drivers
Petrochemicals	56%	Benzene, Styrene, Methanol, Acrylonitrile, Xylene, Naphtha, Caustic Soda, Butadiene, Propylene	Consumer non-durables —70% Consumer durables — 30%
Black Oil	21%	Residual Fuel Oil, Coker Feedstock, Vacuum Gas Oil, Asphalt, Carbon Black Feedstock, Crude Oil, Natural Gas Condensate, Ship Bunkers	Fuel for Power Plants and Ships, Feedstock for Refineries, Road Construction
Refined Petroleum Products	19%	Gasoline, No. 2 Oil, Jet Fuel, Heating Oil, Diesel Fuel, Ethanol	Vehicle Usage, Air Travel, Weather Conditions, Refinery Utilization
Agricultural Chemicals	4%	Anhydrous Ammonia, Nitrogen-Based Liquid Fertilizer, Industrial Ammonia	Corn, Cotton and Wheat Production, Chemical Feedstock Usage

2018 Compared with 2017

Marine Transportation Revenues

Marine transportation revenues for 2018 increased 12% when compared with 2017 primarily due to the addition of the Higman inland tank barges acquired on February 14, 2018 and the Targa pressure barges acquired on May 10, 2018, and improved barge utilization and spot contract pricing in the inland market. Partially offsetting the increase were lower term and spot contract pricing in the coastal market, poor seasonal weather conditions in the first four months and fourth quarter of 2018, lock closures in the 2018 second half and fewer coastal tank barges available with the impairment and retirement of 12 tank barges in the 2017 fourth quarter. Demand in the coastal markets continued to be impacted by the oversupply of tank barges in the coastal industry. For 2018 and 2017, the inland tank barge fleet contributed 76% and 70%, respectively, and the coastal fleet 24% and 30%, respectively, of marine transportation revenues. The Higman fleet was quickly integrated into the Company's own fleet. The Higman equipment began to operate on the Company's contracts soon after the acquisition and Higman barges worked with the Company's towboats and vice versa resulting in differences in vessel utilization and pricing among individual assets and the consolidated fleet. Due to this quick integration, it is not practical to provide a specific amount of revenues for Higman but the acquisition in February 2018 was one of the primary factors that drove increases in marine transportation revenues in 2018 as compared to 2017.

Tank barge utilization levels of the Company's inland marine transportation markets were in the mid-90% range during the 2018 first quarter, high 80% to low 90% during the second quarter, and the low to mid-90% range during the third and fourth quarters. Increased customer demand and poor seasonal operating conditions contributed to a tight market across the entire inland tank barge industry during 2018. Operating conditions were adversely impacted by high water conditions on the Mississippi River early in the 2018 second quarter, however, weather conditions improved in May and June, enhancing operating efficiency but driving seasonally lower utilization compared to the 2018 first quarter. Increasing volumes from petrochemical and black oil customers, lock infrastructure projects in Louisiana as well as on the Ohio River, and refinery turnarounds contributed to increased utilization during the 2018 second half compared to the 2018 first half.

Coastal tank barge utilization levels improved throughout 2018 from the high 70% range during the 2018 first quarter to the 80% range by end of 2018. The improvement in utilization primarily reflected the impairment and retirement of 12 out-of-service coastal barges during the 2017 fourth quarter.

The petrochemical market, the Company's largest market, contributed 56% of marine transportation revenues for 2018, reflecting continued stable volumes from Gulf Coast petrochemical plants for both domestic consumption and to terminals for export destinations, the addition of the Targa pressure barges in May 2018 and the addition of inland tank barges acquired in July 2017 from an undisclosed competitor. Low priced domestic natural gas, a basic feedstock for the United States petrochemical industry, provides the industry with a competitive advantage relative to naphtha-based foreign petrochemical producers. In addition, favorable commodity prices and the addition of new petrochemical industry capacity in 2017 and 2018 benefited the market.

The black oil market, which contributed 21% of marine transportation revenues for 2018, reflected higher revenues in the inland market primarily due to the addition of the Higman fleet. The Company continued to transport crude oil and natural gas condensate produced from the Eagle Ford and Permian Basin shale formations in Texas both along the Gulf Intracoastal Waterway with inland vessels and in the Gulf of Mexico with coastal equipment, and continued to transport Utica natural gas condensate downriver from the Mid-Atlantic to the Gulf Coast. Revenues for the transportation of black oil products in the coastal market during 2018 were lower compared with 2017 due to the continued industry-wide over supply of tank barges in the coastal industry.

The refined petroleum products market, which contributed 19% of marine transportation revenues for 2018, reflected stronger volumes in the inland market primarily due to the addition of the Higman fleet, partially offset by lower utilization in the coastal market, primarily a result of the oversupply of coastal tank barge capacity.

The agricultural chemical market, which contributed 4% of marine transportation revenues for 2018, saw typical seasonal demand for transportation of both domestically produced and imported products during 2018.

For 2018, the inland operations incurred 10,047 delay days, 33% more than the 7,577 delay days that occurred during 2017. Delay days measure the lost time incurred by a tow (towboat and one or more tank barges) during transit when the tow is stopped due to weather, lock conditions or other navigational factors. The increase in delay days reflected the lock infrastructure projects in the 2018 third quarter and the challenging operating conditions in the 2018 first quarter due to ice on the Illinois River, infrastructure issues on the Ohio River, seasonal fog and high winds, as well as lock delays along the Gulf Intracoastal Waterway. High water conditions on the Ohio and Mississippi Rivers in the first four months of 2018 also increased delay days.

During 2018, approximately 65% of marine transportation inland revenues were under term contracts and 35% were spot contract revenues. For 2017, approximately 75% of inland revenues were under term contracts and 25% were spot contract revenues. These allocations provide the operations with a more predictable revenue stream. Inland time charters, which insulate the Company from revenue fluctuations caused by weather and navigational delay and temporary market declines, represented 59% of inland revenues under term contracts during 2018 compared with 49% for 2017.

During 2018 and 2017, approximately 80% of the coastal marine transportation revenues were under term contracts and 20% were spot contract revenues. Coastal time charters, which insulate the Company from revenue fluctuations caused by weather and navigational delays and temporary market declines, represented approximately 85% of the coastal revenues under term contracts in 2018 and 2017.

Rates on inland term contracts renewed in the 2018 first quarter decreased in the 4% to 6% average range compared with term contracts renewed in the first quarter of 2017. Rates on inland term contracts renewed in the 2018 second quarter increased in the 1% to 3% average range compared with term contracts renewed in the second quarter of 2017. In the 2018 third quarter, rates on inland term contracts renewed increased in the 3% to 5% average range compared with term contracts renewed in the third quarter of 2017. In the 2018 fourth quarter, rates on inland term contracts were generally higher in the 1% to 3% average range, though some multi-year contracts did renew lower, compared with term contracts renewed in the fourth quarter of 2017. Spot contract rates, which include the cost of fuel, increased in the 10% to 15% range in the 2018 first and second quarters compared with the 2017 first and second quarters. In the 2018 third and fourth quarters, spot contract rates increased in the 20% to 25% range compared with the 2017 third and fourth quarters. Effective January 1, 2018, annual escalators for labor and the producer price index on a number of inland multi-year contracts resulted in rate increases on those contracts of approximately 1.0%, excluding fuel.

During 2018 and 2017, approximately 80% of the coastal revenues were under term contracts and 20% were spot contract revenues. Coastal time charters represented approximately 85% of coastal revenues under term contracts during 2018 and 2017. Spot and term contract pricing, which are contingent on various factors including geographic location, vessel capacity, vessel type and product serviced, were stable throughout the 2018 first and second quarters compared with pricing in the 2017 fourth quarter, and moved modestly higher in the 2018 third and fourth quarters. In the 2018 first and second quarters, both term and spot contract pricing declined in the 10% to 15% range compared to the 2017 first and second quarters. Compared to the 2017 third quarter, spot market pricing in the 2018 third quarter was similar but term contract pricing increased modestly. Compared to the 2017 fourth quarter, spot market pricing in the 2018 fourth quarter was approximately 10% higher and term contract pricing increased modestly.

Marine Transportation Costs and Expenses

Costs and expenses for 2018 increased 12% when compared with 2017. Costs of sales and operating expenses for 2018 increased 15% compared with 2017, primarily due to the addition of the Higman fleet of inland tank barges and towboats in February 2018 and higher fuel costs.

The inland marine transportation fleet operated an average of 278 towboats during 2018, of which an average of 77 were chartered, compared with 224 during 2017, of which an average of 70 were chartered. The increase was primarily due to the addition of inland towboats with the Higman acquisition on February 14, 2018. Generally, as demand, or anticipated demand, increases or decreases, as new tank barges are added to the fleet, as chartered towboat availability changes, or as weather or water conditions dictate, the Company charters in or releases chartered towboats in an effort to balance horsepower needs with current requirements. The Company has historically used chartered towboats for approximately one-third of its horsepower requirements.

During 2018, the inland operations consumed 49.3 million gallons of diesel fuel compared to 40.4 million gallons consumed during 2017, driven by the Higman acquisition. The average price per gallon of diesel fuel consumed during 2018 was \$2.20 per gallon compared with \$1.79 per gallon for 2017. Fuel escalation and de-escalation clauses on term contracts are designed to rebate fuel costs when prices decline and recover additional fuel costs when fuel prices rise; however, there is generally a 30 to 90 day delay before the contracts are adjusted. Spot contracts do not have escalators for fuel.

Selling, general and administrative expenses for 2018 increased 5% compared with 2017, primarily due to the addition of Higman personnel and related expenses plus higher incentive compensation accruals. The increase included \$3,261,000 of transaction costs, consisting primarily of legal, audit and other professional fees associated with the Higman acquisition, severance charges of \$2,591,000 associated with the integration of Higman into the Company and further reduction in headcount in the coastal sector in order to manage costs, and \$2,378,000 of non-cash expenses related to the amendment of the employee stock award plan; all of which were incurred in the 2018 first quarter.

Taxes, other than on income for 2018 increased 28% compared with 2017, mainly due to higher property taxes on marine transportation equipment, including the Higman and Targa fleets, and higher waterway use taxes due to higher business activity levels, mainly due to the Higman acquisition.

Marine Transportation Operating Income and Operating Margins

Marine transportation operating income for 2018 increased 9% compared with 2017. The operating margin was 9.9% for 2018 compared with 10.2% for 2017. The operating income increase in 2018 compared to 2017 was primarily due to the acquisitions of Higman and Targa's pressure barge fleet, improved term and spot contract pricing in the inland market, and improved barge utilization in the inland market, partially offset by lower coastal term and spot contract pricing, poor seasonal weather conditions in the first four months and fourth quarter of 2018 and lock closures in the 2018 second half. Higman transaction costs, severance and retirement charges, and expenses related to the amendment of the employee stock award plan also negatively impacted the 2018 first quarter.

2017 Compared with 2016

Marine Transportation Revenues

Marine transportation revenues for 2017 decreased 10% when compared with 2016 primarily due to the industry-wide oversupply of tank barges in both the inland and coastal markets, resulting in lower inland and coastal marine transportation term and spot contract pricing, and lower coastal equipment utilization. In addition, a continued increase in the number of coastal vessels operating in the spot market led to increased idle time and decreased revenues, partially offset by an increase in the average cost of marine diesel fuel which is largely passed through to the customer and the addition of the nine specialty pressure tank barges and four 30,000 barrel tank barges purchased in July 2017. The 2017 revenue decrease was also due to the loss of revenue in the inland and coastal marine transportation markets associated with Hurricanes Harvey and Irma. Operating conditions for the Company's inland marine transportation markets deteriorated significantly after Hurricane Harvey made land-fall on the Texas Gulf Coast at the end of August. Unrelated and coinciding infrastructure repairs on the upper Mississippi River further decreased operating efficiency in September and the fourth quarter. For 2017 and 2016, the inland tank barge fleet contributed 70% and 65%, respectively, and the coastal fleet 30% and 35%, respectively, of marine transportation revenues.

The effect after Hurricane Harvey was an increase in inland tank barge utilization levels from the mid-80% to the mid-90% range during the balance of third quarter compared to the mid-80% to high 80% range during the 2017 second quarter and the high 80% to low 90% range during the 2017 first quarter. As the third quarter concluded, recoveries from marine customers for delays, pent-up demand for liquid barge movements as the Gulf Coast petrochemical and refinery complex returned to normal operations and a stronger pricing environment for customers' products partially mitigated the negative impact of the hurricanes. Utilization for the 2017 fourth quarter ranged from the low to mid-90%. The higher utilization during the fourth quarter reflected a continued favorable pricing environment for customers' products, the addition of new petrochemical industry capacity and the continued retirement of older barges from the fleet. The decline in utilization from the 2017 first quarter to the 2017 second quarter was mainly due to better weather conditions along the Gulf Coast, which enhanced operating efficiency and thereby lowered tank barge utilization, and also due to seasonally weak demand for the transportation of agricultural chemicals.

Coastal tank barge utilization levels declined to the low 60% to mid-60% range during the 2017 third and fourth quarters from the high 60% to mid-70% range during the 2017 second quarter and the mid-70% to low 80% range during the 2017 first quarter. Utilization in the coastal marine fleet continued to be impacted by the industry-wide oversupply of tank barges in the coastal industry and weak demand for the transportation of refined petroleum products and crude oil.

The petrochemical market, the Company's largest market, contributed 56% of marine transportation revenues for 2017, reflecting continued stable volumes from Gulf Coast petrochemical plants for both domestic consumption and to terminals for export destinations, and the addition of the nine specialty pressure tank barges and four 30,000 barrel tank barges purchased in July 2017. Low priced domestic natural gas, a basic feedstock for the United States petrochemical industry, provides the industry with a competitive advantage relative to naphtha-based foreign petrochemical producers. In addition, favorable commodity prices and the addition of new petrochemical industry capacity in the 2017 second half benefited the market.

The black oil market, which contributed 23% of marine transportation revenues for 2017, reflected higher fleet utilization in the inland market compared to 2016. The Company continued to transport crude oil and natural gas condensate produced from the Eagle Ford and Permian Basin shale formations in Texas both along the Gulf Intracoastal Waterway with inland vessels and in the Gulf of Mexico with coastal equipment, and continued to transport Utica natural gas condensate downriver from the Mid-Atlantic to the Gulf Coast, however, at much reduced levels compared with 2016. Demand for the transportation of black oil products in the coastal market for 2017 was lower when compared to 2016 due to the continued industry-wide oversupply of tank barges in the coastal industry.

The refined petroleum products market, which contributed 17% of marine transportation revenues for 2017, reflected weaker demand in both the inland and coastal markets, primarily a result of the oversupply of tank barge capacity, as well as weak heating oil demand in the 2017 first quarter due to the unseasonably warm weather in the Northeast.

The agricultural chemical market, which contributed 4% of marine transportation revenues for 2017, saw typical seasonal demand for transportation of both domestically produced and imported products during the first, third and fourth quarters and a typical seasonal decline in demand in the second quarter.

For 2017, the inland operations incurred 7,577 delay days, 4% more than the 7,278 delay days that occurred during 2016. Delay days measure the lost time incurred by a tow (towboat and one or more tank barges) during transit when the tow is stopped due to weather, lock conditions or other navigational factors. The increase in delay days reflected lost time incurred during and after Hurricane Harvey in late August and September and during the unrelated and coinciding upper Mississippi River infrastructure repairs in September and during the fourth quarter.

During 2017 and the 2016 fourth quarter, approximately 75% of marine transportation inland revenues were under term contracts and 25% were spot contract revenues. For the 2016 first nine months, approximately 80% of inland revenues were under term contracts and 20% were spot contract revenues. These allocations provide the operations with a more predictable revenue stream. Inland time charters, which insulate the Company from revenue fluctuations caused by weather and navigational delay and temporary market declines, represented 49% of inland revenues under term contracts during 2017 compared with 52% for 2016.

During 2017 and 2016, mainly due to lower revenues for equipment trading in the spot market, approximately 80% of the coastal marine transportation revenues were under term contracts and 20% were spot contract revenues. Coastal time charters, which insulate the Company from revenue fluctuations caused by weather and navigational delays and temporary market declines, represented approximately 85% of the coastal revenues under term contracts in 2017 and 2016.

Rates on inland term contracts renewed in 2017 continued to deteriorate due to excess industry capacity, decreasing in the 4% to 8% average range compared with term contracts renewed in 2016. Spot contract rates, which include the cost of fuel, were relatively consistent throughout the year but were below term contract rates. Effective January 1, 2017, annual escalators for labor and the producer price index on a number of inland multi-year contracts resulted in rate increases on those contracts of approximately 0.6%, excluding fuel.

There were few coastal term contracts renewed in 2017 as customers elected to source their needs in the spot market. Rates on coastal term contracts renewed in 2017 were down slightly compared to term contracts renewed in 2016, although most contracts failed to renew and customers elected to source their needs in the spot market. Spot contract rates, which include the cost of fuel, remained meaningfully below term contract rates during 2017, the degree to which varies based on geography, vessel capacity, vessel type and product serviced.

Marine Transportation Costs and Expenses

Costs and expenses for 2017 decreased 2% compared with 2016. Costs of sales and operating expenses for 2017 decreased 3% compared with 2016, primarily due to fewer inland towboats operated and lower business activity levels, partially offset by higher fuel costs and costs and expenses associated with Hurricanes Harvey and Irma.

The inland marine transportation fleet operated an average of 224 towboats during 2017, of which an average of 70 towboats were chartered, compared with 234 towboats during 2016, of which an average of 73 towboats were chartered. As demand, or anticipated demand, increases or decreases, as new tank barges are added to the fleet or older tank barges are removed from the fleet, as chartered towboat availability changes, or as weather or water conditions dictate, such as the high wind and heavy fog conditions that occurred in the 2017 first and fourth quarters, the Company charters in or releases chartered towboats in an effort to balance horsepower needs with current requirements. The Company has historically used chartered towboats for approximately one-third of its horsepower requirements.

During 2017, the inland operations consumed 40.4 million gallons of diesel fuel compared to 40.0 million gallons consumed during 2016. The average price per gallon of diesel fuel consumed during 2017 was \$1.79 per gallon compared with \$1.46 per gallon for 2016. Fuel escalation and de-escalation clauses on term contracts are designed to rebate fuel costs when prices decline and recover additional fuel costs when fuel prices rise; however, there is generally a 30 to 90 day delay before the contracts are adjusted. Spot contracts do not have escalators for fuel.

Selling, general and administrative expenses for 2017 increased 7% compared with 2016, primarily due to salary increases effective August 1, 2016 and April 1, 2017, higher incentive compensation accruals and higher professional fees, partially offset by cost savings in 2017 from the reduction in force in early 2016.

Taxes, other than on income for 2017 increased 24% compared with 2016, mainly due to higher property taxes on marine transportation equipment, new state franchise taxes effective January 1, 2017 and the addition of S&S in September 2017.

Marine Transportation Operating Income and Operating Margins

Marine transportation operating income for 2017 decreased 48% compared with 2016. The operating margin was 10.2% for 2017 compared with 17.6% for 2016. The results primarily reflected lower inland and coastal term and spot contract pricing, lower coastal equipment utilization and a continued increase in coastal equipment operating in the spot market which added increased idle time and voyage costs, partially offset by savings in the coastal market from the release of chartered tugboats, idling owned barges and tugboats and reducing headcount accordingly, and a reduction in the average number of inland towboats operated. The 2017 operating income decrease was also due to the loss of revenue and additional operating expenses in the inland and coastal marine transportation markets associated with Hurricanes Harvey and Irma. As the third quarter concluded, recoveries from marine customers for delays, pent-up demand for liquid barge movements as the Gulf Coast petrochemical and refinery complex returned to normal operations and a stronger pricing environment for customers' products partially mitigated the negative impact of the hurricanes.

Distribution and Services

The Company, through its distribution and services segment, sells genuine replacement parts, provides service mechanics to overhaul and repair engines, transmissions, reduction gears and related oilfield services equipment, rebuilds component parts or entire diesel engines, transmissions and reduction gears, and related equipment used in oilfield services, marine, mining, power generation, on-highway and other industrial applications. The Company also rents equipment including generators, fork lifts, pumps and compressors for use in a variety of industrial markets, and manufactures and remanufactures oilfield service equipment, including pressure pumping units, for the oilfield service and oil and gas operator and producer markets.

The following table sets forth the Company's distribution and services segment's revenues, costs and expenses, operating income and operating margins for the three years ended December 31, 2018 (dollars in thousands):

	2018	2017	% Change 2017 to 2018	2016	% Change 2016 to 2017
Distribution and services revenues	\$ 1,487,554	\$ 890,312	67%	\$ 298,780	198%
Costs and expenses:					
Costs of sales and operating expenses	1,162,967	691,029	68	226,262	205
Selling, general and administrative	149,756	89,060	68	54,756	63
Taxes, other than on income	6,177	3,357	84	1,861	80
Depreciation and amortization	39,349	20,387	93	12,833	59
	<u>1,358,249</u>	<u>803,833</u>	<u>69</u>	<u>295,712</u>	<u>172</u>
Operating income	\$ 129,305	\$ 86,479	50%	\$ 3,068	2,719%
Operating margins	<u>8.7%</u>	<u>9.7%</u>		<u>1.0%</u>	

The following table shows the markets serviced by the Company, the revenue distribution for 2018, and the customers for each market:

Markets Serviced	2018 Revenue Distribution	Customers
Oil and Gas	68%	Oilfield Services, Oil and Gas Operators and Producers
Commercial and Industrial	32%	Inland River Carriers — Dry and Liquid, Offshore Towing — Dry and Liquid, Offshore Oilfield Services — Drilling Rigs & Supply Boats, Harbor Towing, Dredging, Great Lakes Ore Carriers, Pleasure Crafts, On and Off-Highway Transportation, Power Generation, Standby Power Generation, Pumping Stations, Mining

2018 Compared with 2017

Distribution and Services Revenues

Distribution and services revenues for 2018 increased 67% when compared with 2017. The higher revenues were primarily attributable to the acquisition of S&S, completed on September 13, 2017, as well as increased demand in the oil and gas market for the manufacturing of oilfield service equipment, including new pressure pumping units, the sale and distribution of engines and related parts, and improving market conditions in the commercial marine diesel engine repair business, partially offset by lower demand in the 2018 second half for new and overhauled transmissions and related parts and remanufactured pressure pumping units from some key oilfield customers. The S&S operations were quickly integrated into the Company's own operations. This helped the Company to secure orders for the manufacture of pressure pumping units that both standalone companies would have struggled to deliver on-time to the customer and would likely have not received, as well as began to complete orders at each other's manufacturing facilities for geographic convenience as well. Due to the accelerated integration, it is not practical to provide a specific amount of revenues for S&S, but the acquisition of S&S in 2017 was one of the primary factors that drove increases in distribution and services revenues in 2018 compared to 2017 and 2017 compared to 2016.

For 2018, the oil and gas market contributed approximately 68% of the distribution and services revenues. The increased demand challenged the Company's vendor supply chain in 2018 and created delays for the delivery of new engines, transmissions and parts required for the completion of both new and remanufactured oilfield service equipment, including pressure pumping units, and impacted the recognition of revenue. However, the supply chain issues were largely resolved during the 2018 fourth quarter resulting in a sequential increase in the number of new and remanufactured pressure pumping units delivered in the fourth quarter. In the commercial and industrial market, approximately 32% of the distribution and services revenues for 2018, the marine sector experienced higher service levels for diesel engine service and related parts sales throughout 2018. The power generation sector saw increased demand from commercial customers for specialty rental units and back-up power systems in the 2018 second and third quarters in anticipation of and as a result of summer storms. Demand for standby-by power generation equipment declined in the 2018 fourth quarter compared to the 2017 fourth quarter which had experienced higher levels of activity during the 2017 hurricane season. Demand in the nuclear power generation market was stable compared to 2017.

Distribution and Services Costs and Expenses

Costs and expenses for 2018 increased 69%, compared with 2017. Costs of sales and operating expenses for 2018 increased 68% compared with 2017, reflecting the acquisition of S&S on September 13, 2017, as well as increased demand for the remanufacture of pressure pumping units and transmission overhauls, improvement in the manufacturing of oilfield service equipment, including pressure pumping units, and an increase in demand for the sale and distribution of engines, transmissions and related parts in the oil and gas market.

Selling, general and administrative expenses for 2018 increased 68%, compared with 2017, primarily due to the S&S acquisition, as well as increased activity in the oil and gas market. The 2018 year included a \$171,000 severance charge incurred in the 2018 first quarter associated with the integration of S&S into the Company and \$1,168,000 of non-cash expenses, also incurred in the 2018 first quarter, related to the amendment of the employee stock award plan.

Distribution and Services Operating Income and Operating Margins

Operating income for the distribution and services segment for 2018 increased 50% compared to 2017. The operating margin for 2018 was 8.7% compared with 9.7% for 2017. The results primarily reflected the earnings contribution of S&S and continued strong demand for the remanufacture of pressure pumping units and transmission overhauls, the manufacturing of oilfield service equipment, and the sale of new transmissions and related parts.

2017 Compared with 2016

Distribution and Services Revenues

Distribution and services revenues for 2017 increased 198% compared with 2016, primarily attributable to the increased demand in the oil and gas market for the remanufacture of pressure pumping units and transmission overhauls, an improvement in the manufacturing of oilfield service equipment, including pressure pumping units, and an increase in the demand for the sale and distribution of engines, transmissions and related parts. The 2017 higher revenues also reflected the S&S acquisition on September 13, 2017. S&S benefited from healthy demand for service work, parts sales and the manufacturing of pressure pumping unit. In the commercial and industrial marine sector, throughout the 2017 first nine months, customers deferred major maintenance projects largely due to the weak inland and coastal tank barge markets and inland dry cargo barge market, and experienced continued weakness in the Gulf of Mexico oilfield services market. During the 2017 fourth quarter, the marine sector experienced a modest turnaround in orders for new engines and overhauls on medium-speed engines that had been deferred, as well as higher demand for new parts in the Gulf Coast offshore drilling market. The power generation market was relatively stable with major generator set upgrades and parts sales for both domestic and international power generation customers. The commercial and industrial market of S&S benefited from elevated demand for rental equipment and increased service work as a result of pent-up demand following Hurricanes Harvey, Irma and Maria.

Distribution and Services Costs and Expenses

Costs and expenses for 2017 increased 172% compared with 2016. Costs of sales and operating expenses for 2017 increased 205% compared with 2016, reflecting the increased demand for the remanufacture of pressure pumping units and transmission overhauls, improvement in the manufacturing of oilfield service equipment, including pressure pumping units, an increase in the demand for the sale and distribution of engines, transmissions and related parts in the oil and gas market, and the S&S acquisition on September 13, 2017.

Selling, general and administrative expenses for 2017 increased 63% compared with 2016, primarily due to increased activity in the oil and gas market in 2017, as well as the S&S acquisition on September 13, 2017. The 2017 fourth quarter included a \$1,581,000 severance charge in the marine sector, in response to the reduced activity, and S&S, associated with the integration of S&S and the Company. The 2016 first quarter included a \$1,436,000 severance charge, in response to the reduced activity in both oil and gas market and the commercial and industrial marine sector, which benefited the 2017 results.

Distribution and Services Operating Income and Operating Margins

Operating income for the distribution and services segment for 2017 increased 2,719% compared to 2016. The operating margin for 2017 was 9.7% compared with 1.0% for 2016. The results primarily reflected the earnings contribution of S&S and continued strong demand for the remanufacture of pressure pumping units and transmission overhauls, the manufacturing of oilfield service equipment, and the sale of new transmissions and related parts.

General Corporate Expenses

General corporate expenses for 2018, 2017 and 2016 were \$35,590,000, \$18,202,000 and \$15,024,000, respectively. The 96% increase for 2018 compared to 2017 was primarily due to a one-time non-deductible expense of \$18,057,000 in the 2018 second quarter related to the retirement of the Company's executive Chairman, effective April 30, 2018, and higher incentive compensation accruals. The Company's retired executive Chairman continues to serve as Chairman of the Board in a non-executive role. The 2018 year included \$392,000 incurred in the 2018 first quarter due to the corporate portion of the amendment of the employee stock award plan. The 21% increase for 2017 compared to 2016 was primarily due to \$2,119,000 of S&S acquisition costs incurred during 2017.

Gain (Loss) on Disposition of Assets

The Company reported a net gain on disposition of assets of \$1,968,000 in 2018 compared with a net loss on disposition of assets of \$4,487,000 in 2017 and \$127,000 in 2016. The net gains in 2018 was predominantly from the sale or retirement of marine equipment and the sale of distribution and services' properties. The 2017 loss was primarily from the retirement and sale of older and less efficient inland towboats during the 2017 fourth quarter. The net loss for 2016 was predominantly from the sale or retirement of marine equipment.

Other Income and Expenses

The following table sets forth impairment of long-lived assets, impairment of goodwill, lease cancellation costs, equity in earnings of affiliates, other income (expense), noncontrolling interests and interest expense for the three years ended December 31, 2018 (dollars in thousands):

	2018	2017	% Change 2017 to 2018	2016	% Change 2016 to 2017
Impairment of long-lived assets	\$ (82,705)	\$ (105,712)	(22)%	\$ —	N/A
Impairment of goodwill	(2,702)	—	N/A	—	N/A
Lease cancellation costs	(2,403)	—	N/A	—	N/A
Equity in earnings of affiliates	355	291	22%	532	(45)%
Other income (expense)	5,371	570	842%	(2,466)	123%
Noncontrolling interests	(626)	(716)	(13)%	(1,398)	(49)%
Interest expense	(46,856)	(21,472)	118%	(17,690)	21%

Impairment of Long-lived Assets

During the fourth quarter of 2018, the Company recorded a \$82,705,000 non-cash pre-tax impairment charge. The after-tax effect of the charge was \$65,337,000 or \$1.09 per share. The USCG adopted regulations on BWMS establishing a standard for the allowable concentration of living organisms in certain vessel ballast water discharged in waters of the United States under the National Invasive Species Act. The regulations include requirements for the installation of engineering equipment to treat ballast water by establishing an approval process for BWMS. The USCG has approved manufacturers' systems that met the regulatory discharge standard equivalent to the International Maritime Organization's D-2 standard. The phase-in schedule for those existing vessels requiring a system to install BWMS equipment is dependent on vessel build date, ballast water capacity, and drydock schedule. Compliance with the ballast water treatment regulations requires the installation of equipment on some of the Company's vessels to treat ballast water before it is discharged. The installation of BWMS equipment will require significant capital expenditures at the next scheduled drydocking to complete the installation of the approved system on those existing vessels that require a system to comply with the BWMS regulations.

Due to the advanced age of four of the Company's older ATBs and the high cost of installation of BWMS, the Company will retire the ATBs at their next scheduled shipyard dates which range between 2020 and 2023 instead of installing the expensive BWMS equipment required to operate the vessels past their next required shipyard dates. A pre-tax impairment charge of \$78,835,000 was incurred in the fourth quarter of 2018 to reduce the ATBs to a fair value of \$13,247,000 due to reduced estimated cash flows resulting from reduced lives on these four older ATBs. The reduced estimated useful lives are due to the assessment of the impact of the new regulations by USCG that require the installation of BWMS. The fair value of the four ATBs of \$13,247,000 is presented in marine transportation equipment at December 31, 2018.

The impairment charge also included a pre-tax charge of \$3,870,000 as the Company reduced the carrying value of its improvements in a leased barge to its scrap value of \$220,000. As part of a lease termination, the Company agreed to terminate the lease, purchase the barge and then scrap the barge which resulted in the Company committing to put the barge up for sale in December 2018. The barge was scrapped in January 2019. The fair market value of the barge was \$220,000 at December 31, 2018, and was presented in prepaid expenses and other current assets. In addition, the Company incurred \$2,403,000 in lease cancellation costs in December 2018 related to the leased barge.

During the fourth quarter of 2017, the Company recorded a \$105,712,000 non-cash pre-tax impairment charge. The after-tax effect of the charge was \$66,975,000 or \$1.20 per share. The impairment charge was to reduce certain vessels to a fair value of \$12,550,000 as the Company decided to put certain older out-of-service vessels up for sale in its marine transportation segment in response to lower equipment utilization, pricing pressure and expensive BWMS installations required in the next few years on some of the coastal tank barges. Retiring some of the older coastal marine vessels reduces the fleet's age profile and improves the efficiency of the fleet. The fair market value of the vessels was \$12,550,000 at December 31, 2017, and was presented in prepaid expenses and other current assets.

Impairment of Goodwill

During the fourth quarter of 2018, the Company took a \$2,702,000 charge for the impairment of the remaining goodwill recorded for Osprey. The impairment reflected the reduced profitability outlook of the container-on-barge operations due to the current economic environment.

Equity in Earnings of Affiliates

Equity in earnings of affiliates primarily consisted of the Company's 50% ownership of a barge fleeting operation.

Other Income (Expense)

Due to the Company's adoption of Accounting Standards Update ("ASU") 2017-07 on January 1, 2018, other income for 2018 includes income of \$4,517,000 for all components of net benefit costs except the service cost component related to the Company's defined benefit plans. The standard was applied retrospectively resulting in a reclassification of income for 2017 of \$621,000 and expense for 2016 of \$2,175,000 from operating expense to non-operating expense.

Interest Expense

Interest expense for 2018 increased 118% compared with 2017, primarily due to borrowings to finance the cash portion of the S&S acquisition in September 2017, the Higman acquisition in February 2018, the acquisition of Targa's pressure barge fleet in May 2018 and the purchase of the 155,000 barrel coastal ATB under construction in June 2018. Interest expense for 2017 increased 21% compared with 2016, primarily due to borrowings under the revolving credit facility to finance the S&S acquisition and lower capitalized interest. During 2018, 2017 and 2016, the average debt and average interest rate (excluding capitalized interest expense) were \$1,370,905,000 and 3.5%, \$774,058,000 and 3.0%, and \$750,499,000 and 2.7%, respectively. Interest expense for 2018, 2017 and 2016 excludes capitalized interest of \$2,206,000, \$1,731,000 and \$2,974,000, respectively.

Financial Condition, Capital Resources and Liquidity

Balance Sheet

Total assets at December 31, 2018 were \$5,871,594,000 compared with \$5,127,427,000 at December 31, 2017 and \$4,289,895,000 at December 31, 2016. The December 31, 2018 total assets reflect the Higman acquisition in February 2018 for \$421,922,000, the purchase of Targa's inland tank barge business in May 2018 for \$69,250,000 and the purchase in December 2018 of inland tank barges from CGBM for \$28,500,000, all more fully described under Acquisitions above. The December 31, 2017 total assets reflect the S&S acquisition in September 2017 for \$758,213,000 and the purchase in July 2017 of tank barges and towboats from an undisclosed competitor for \$68,000,000, both more fully described under Acquisitions above. The following table sets forth the significant components of the balance sheet as of December 31, 2018 compared with 2017 and 2017 compared with 2016 (dollars in thousands):

	<u>2018</u>	<u>2017</u>	<u>% Change 2017 to 2018</u>	<u>2016</u>	<u>% Change 2016 to 2017</u>
Assets:					
Current assets	\$ 1,096,489	\$ 957,082	15%	\$ 632,951	51%
Property and equipment, net	3,539,802	2,959,265	20	2,921,374	1
Investment in affiliates	2,495	1,890	32	2,622	(28)
Goodwill	953,826	935,135	2	598,131	56
Other intangibles, net	224,197	232,808	(4)	87,306	167
Other assets	54,785	41,247	33	47,511	(13)
	<u>\$ 5,871,594</u>	<u>\$ 5,127,427</u>	<u>15%</u>	<u>\$ 4,289,895</u>	<u>20%</u>
Liabilities and stockholders' equity:					
Current liabilities	\$ 607,782	\$ 480,306	27%	\$ 358,338	34%
Long-term debt-less current portion	1,410,169	992,403	42	722,802	37
Deferred income taxes	542,785	468,451	16	705,453	(34)
Other long-term liabilities	94,557	72,044	31	90,435	(20)
Total equity	3,216,301	3,114,223	3	2,412,867	29
	<u>\$ 5,871,594</u>	<u>\$ 5,127,427</u>	<u>15%</u>	<u>\$ 4,289,895</u>	<u>20%</u>

2018 Compared with 2017

Current assets as of December 31, 2018 increased 15% compared with December 31, 2017. Inventories, net, increased 61%, primarily reflecting higher inventories, including work in process, in the distribution and services oil and gas market due to the adoption of ASU 2014-09 and to meet current business activity levels. Prepaid expenses and other current assets decreased 5% primarily due the sale of marine vessels in 2018 that were classified as assets held for sale in the 2017 fourth quarter. Trade accounts receivable decreased 8%, primarily reflecting decreased business activity levels in the distribution and services oil and gas market and lower revenue recognized due to the adoption of ASU 2014-09.

Property and equipment, net of accumulated depreciation, at December 31, 2018 increased 20% compared with December 31, 2017. The increase reflected \$318,302,000 of capital expenditures for 2018, more fully described under Capital Expenditures Reflected on the Balance Sheet below, the fair value of the property and equipment acquired in acquisitions of \$585,155,000, less \$208,212,000 of depreciation expense and \$46,083,000 of property disposals during 2018. In addition, during 2018, the Company took an impairment charge, more fully described under Impairment of Long-lived Assets above, that reduced the carrying value of marine transportation equipment by \$76,779,000.

Goodwill as of December 31, 2018 increased 2% compared with December 31, 2017, predominantly reflecting the goodwill recorded in the Higman and Targa acquisitions.

Other intangibles, net, as of December 31, 2018 decreased 4% compared with December 31, 2017, reflecting amortization of \$19,613,000, partially offset by intangible assets other than goodwill recorded in the Targa acquisition.

Other assets at December 31, 2018 increased 33% compared with December 31, 2017 primarily due to the addition of deferred major maintenance drydock expenditures on ocean-going vessels, net of amortization.

Current liabilities as of December 31, 2018 increased 27% compared with December 31, 2017. Accounts payable increased 25%, primarily due to increased business activity levels in the distribution and services segment, the acquisition of Higman and higher shipyard accruals. Accrued liabilities increased 18% primarily due to accrued liabilities assumed in the Higman acquisition including an increase in taxes other than on income, primarily waterway use taxes and property taxes, and an increase in employee incentive compensation. Deferred revenues increased 66%, primarily in the distribution and services segment, reflecting changes in revenue recognition with the adoption of ASU 2014-09.

Long-term debt, less current portion, as of December 31, 2018 increased 42% compared with December 31, 2017, primarily reflecting the issuance on February 12, 2018 of \$500,000,000 under the 2028 Notes to fund the acquisition of Higman, partially offset by payments of \$78,455,000 on the revolving credit facilities during 2018. Net debt discount and deferred issuance costs were \$7,204,000 and \$3,442,000 at December 31, 2018 and December 31, 2017, respectively.

Deferred income taxes as of December 31, 2018 increased 16% compared with December 31, 2017, primarily reflecting \$40,524,000 of deferred income taxes recorded with the Higman acquisition and the 2018 deferred tax provision of \$34,881,000.

Other long-term liabilities as of December 31, 2018 increased 31% compared with December 31, 2017. The increase was primarily due to \$11,100,000 of intangible liabilities related to unfavorable contracts of the Higman acquisition and the pension plan liability assumed with the Higman acquisition of \$33,116,000, partially offset by contributions of \$8,102,000 to the Higman pension plan during 2018.

Total equity as of December 31, 2018 increased 3% compared with December 31, 2017. The increase was primarily the result of \$78,452,000 of net earnings attributable to Kirby for 2018, an increase in additional paid-in capital of \$20,386,000, primarily due to the employee stock award plan amendment which resulted in shorter expense accrual periods on stock options and RSUs granted after February 19, 2018 to employees who are nearing retirement and meet certain years of service and age requirements, a \$6,432,000 decrease in treasury stock and a \$9,722,000 decrease in the opening balance of retained earnings with the adoption of ASU 2014-09. The decrease in treasury stock was mainly due to the issuance of restricted stock and the exercise of stock options in connection with stock award plans, partially offset by purchases during 2018 of \$776,000 of the Company's common stock.

2017 Compared with 2016

Current assets as of December 31, 2017 increased 51% compared with December 31, 2016. Trade accounts receivable increased 52%, primarily reflecting the S&S acquisition, as well as an increase in business activity levels in the distribution and services oil and gas market, partially offset by decreased business activity levels in the marine transportation segment. Inventory in the distribution and services segment increased 70%, reflecting the inventory acquired with the S&S acquisition and the building of inventories in the oil and gas market to meet current business activity levels. Prepaid expenses and other current assets increased 27% due to the S&S acquisition and to vessels with a fair value of \$12,550,000 being committed to be sold in 2018, being reclassified from property and equipment to assets held for sale included in prepaid expenses and other current assets.

Property and equipment, net of accumulated depreciation, at December 31, 2017, increased 1% compared with December 31, 2016. The increase reflected \$171,697,000 of capital expenditures for 2017 more fully described under Capital Expenditures Reflected on the Balance Sheet below, and the fair value of the property and equipment acquired in acquisitions of \$228,066,000, less \$191,584,000 of depreciation expense for 2017 and \$57,458,000 of property disposals during 2017. In addition, during 2017, the Company took an impairment charge of \$105,712,000, more fully described under Impairment of Long-lived Assets above, and reclassified \$112,770,000 of property and equipment to assets held for sale included in prepaid expenses and other current assets.

Goodwill as of December 31, 2017 increased 56% compared with December 31, 2016, predominantly reflecting the goodwill recorded in the S&S acquisition and the barge fleet and marine fueling operation business acquisition.

Other intangibles, net, as of December 31, 2017, increased 167% compared with December 31, 2016, mainly due to \$157,400,000 of intangibles other than goodwill associated with the acquisition of S&S. This increase was partially offset by amortization of \$12,098,000.

Other assets at December 31, 2017 decreased 13% compared with December 31, 2016, primarily reflecting amortization of deferred major maintenance drydock expenditures on ocean-going vessels during 2017, net of additions.

Current liabilities as of December 31, 2017 increased 34% compared with December 31, 2016, primarily reflecting the current liabilities of S&S. Accounts payable increased 65%, a reflection of the S&S acquisition, as well as increased business activity levels in the distribution and services oil and gas market. Accrued liabilities increased 14%, the majority of which was attributable to the S&S acquisition, partially offset by a reduction in insurance claims payable. Deferred revenues increased 34%, primarily reflecting the S&S acquisition, offset by decreased advanced billings in the distribution and services oil and gas market and the coastal marine transportation market.

Long-term debt, less current portion, as of December 31, 2017 increased 37% compared with December 31, 2016, primarily reflecting the borrowings under the Company's Revolving Credit Facility in September 2017 to finance the S&S acquisition and the purchase in July 2017 of tank barges and towboats from an undisclosed competitor. Net deferred debt issue costs were \$3,442,000 and \$3,184,000 at December 31, 2017 and December 31, 2016, respectively.

Deferred income taxes as of December 31, 2017 decreased 34% compared with December 31, 2016. The decrease primarily reflected the 2017 deferred tax benefit of \$256,263,000 driven by the remeasurement of deferred tax assets and liabilities due to tax reform, partially offset by an increase in deferred tax liabilities of \$8,486,000 due to the adoption of ASU 2016-09 on January 1, 2017. The adoption reduced deferred tax assets by \$8,486,000, which reflected the cumulative difference between the tax effect of stock-based compensation recognized for tax purposes and amounts recognized for financial reporting purposes, resulting in the recognition of a cumulative-effect adjustment to retained earnings of \$8,486,000.

Other long-term liabilities as of December 31, 2017 decreased 20% compared with December 31, 2016. The decrease was primarily due to a reduction in the pension liability related to a pension plan amendment on April 12, 2017 that lowered the projected benefit obligation of the pension plan by \$33,433,000, partially offset by the accrual of pension expense during 2017.

Total equity as of December 31, 2017 increased 29% compared with December 31, 2016. The increase was the result of \$313,187,000 of net earnings attributable to Kirby for 2017, an increase in accumulated other comprehensive income ("OCI") of \$18,602,000, stock issued with a fair value of \$366,554,000 in connection with the S&S acquisition and a \$7,128,000 decrease in treasury stock, partially offset by an \$8,486,000 decrease in retained earnings due to the adoption of ASU 2016-09. The increase in accumulated OCI primarily resulted from the decrease in unrecognized losses related to the Company's defined benefit plans driven by the pension plan amendment on April 12, 2017. The decrease in treasury stock was due to the issuance of restricted stock and the exercise of stock options in connection with stock award plans.

Retirement Plans

The Company sponsors a defined benefit plan for its inland vessel personnel and shore based tankermen. The plan benefits are based on an employee's years of service and compensation. The plan assets consist primarily of equity and fixed income securities. The Company's pension plan funding strategy is to make annual contributions in amounts equal to or greater than amounts necessary to meet minimum government funding requirements. No pension contribution was made in 2018, 2017 or 2016 for the 2018, 2017 and 2016 years. The fair value of plan assets was \$269,403,000 and \$294,995,000 at December 31, 2018 and December 31, 2017, respectively.

On April 12, 2017, the Company amended its pension plan to cease all benefit accruals for periods after May 31, 2017 for certain participants. Participants grandfathered and not impacted were those, as of the close of business on May 31, 2017, who either (a) had completed 15 years of pension service or (b) had attained age 50 and completed 10 years of pension service. Participants non-grandfathered are eligible to receive discretionary 401(k) plan contributions. The Company did not incur any one-time charges related to this amendment but the pension plan's projected benefit obligation decreased by \$33,433,000.

On February 14, 2018, with the acquisition of Higman, the Company assumed Higman's pension plan for its inland vessel personnel and office staff. On March 27, 2018, the Company amended the Higman pension plan to close it to all new entrants and cease all benefit accruals for periods after May 15, 2018 for all participants. The Company did not incur any one-time charges related to this amendment but the Higman pension plan's projected benefit obligation decreased by \$3,081,000. The Company made a pension contribution to the Higman plan of \$6,717,000 in March 2018 to complete all required funding for the 2016 and 2017 years and make its 2018 first quarter contribution. The Company made an additional contribution to the Higman pension plan of \$1,385,000 in the fourth quarter of 2018 for the 2018 year. The fair value of plan assets was \$33,748,000 at December 31, 2018.

The Company's investment strategy focuses on total return on invested assets (capital appreciation plus dividend and interest income). The primary objective in the investment management of assets is to achieve long-term growth of principal while avoiding excessive risk. Risk is managed through diversification of investments within and among asset classes, as well as by choosing securities that have an established trading and underlying operating history.

The Company makes various assumptions when determining defined benefit plan costs including, but not limited to, the current discount rate and the expected long-term return on plan assets. Discount rates are determined annually and are based on a yield curve that consists of a hypothetical portfolio of high quality corporate bonds with maturities matching the projected benefit cash flows. The Company used discount rates of 4.4% and 3.7% in 2018 and 2017, respectively, in determining its benefit obligations. The Company estimates that every 0.1% decrease in the discount rate results in an increase in the ABO of approximately \$6,300,000. The Company assumed that plan assets would generate a long-term rate of return of 7.0% in 2018 and 2017. The Company developed its expected long-term rate of return assumption by evaluating input from investment consultants and comparing historical returns for various asset classes with its actual and targeted plan investments. The Company believes that long-term asset allocation, on average, will approximate the targeted allocation.

Long-Term Financing

On February 12, 2018, the Company issued \$500,000,000 of 4.2% senior unsecured notes due March 1, 2028 (the "2028 Notes") with U.S. Bank National Association, as trustee. Interest payments of \$10,500,000 are due semi-annually on March 1 and September 1 of each year, with the exception of the first payment on September 1, 2018, which was \$11,608,000. The Company received cash proceeds of \$495,019,000, net of the original issue discount of \$705,000 and debt issuance costs of \$4,276,000. The 2028 Notes are unsecured and rank equally in right of payment with the Company's other unsecured senior indebtedness. The 2028 Notes contain certain covenants on the part of the Company, including covenants relating to liens, sale-leasebacks, asset sales and mergers, among others. The 2028 Notes also specify certain events of default, upon the occurrence of which the maturity of the notes may be accelerated, including failure to pay principal and interest, violation of covenants or default on other indebtedness, among others. The Company used the proceeds from the issuance of the 2028 Notes to fund the acquisition of Higman. The remaining net proceeds of the sale of the 2028 Notes were used for the repayment of indebtedness under the Company's bank credit facilities. As of December 31, 2018, the Company was in compliance with all the 2028 Notes covenants and had \$500,000,000 outstanding under the 2028 Notes.

The Company has an \$850,000,000 unsecured revolving credit facility (“Revolving Credit Facility”) with a syndicate of banks, with JPMorgan Chase Bank, N.A. as the administrative agent bank, with a maturity date of June 26, 2022. In addition, the credit agreement allows for a \$300,000,000 increase in the aggregate commitments of the banks in the form of revolving credit loans or term loans, subject to the consent of each bank that elects to participate in the increased commitment. The variable interest rate spread varies with the Company’s senior debt rating and, effective February 20, 2018, due to a change in one of the Company’s credit ratings, the spread over LIBOR increased from 1.00% to 1.125% and the Alternate Base Rate spread is currently 0.125% over the agent bank’s prime rate. The commitment fee increased as well from 0.10% to 0.15%. The Revolving Credit Facility contains certain restrictive financial covenants including an interest coverage ratio and a debt-to-capitalization ratio. In addition to financial covenants, the Revolving Credit Facility contains covenants that, subject to exceptions, restrict debt incurrence, mergers and acquisitions, sales of assets, dividends and investments, liquidations and dissolutions, capital leases, transactions with affiliates and changes in lines of business. Borrowings under the Revolving Credit Facility may be used for general corporate purposes, the purchase of existing or new equipment, the purchase of the Company’s common stock, or for business acquisitions. As of December 31, 2018, the Company was in compliance with all Revolving Credit Facility covenants and had \$417,373,000 of debt outstanding under the Revolving Credit Facility. The average borrowing under the Revolving Credit Facility during 2018 was \$411,613,000, computed by averaging the daily balance, and the weighted average interest rate was 3.1%, computed by dividing the interest expense under the Revolving Credit Facility by the average Revolving Credit Facility borrowing. The Revolving Credit Facility includes a \$25,000,000 commitment which may be used for standby letters of credit. Outstanding letters of credit under the Revolving Credit Facility were \$6,788,000 as of December 31, 2018.

The Company has \$500,000,000 of unsecured senior notes (“Senior Notes Series A” and “Senior Notes Series B”) with a group of institutional investors, consisting of \$150,000,000 of 2.72% Senior Notes Series A due February 27, 2020 and \$350,000,000 of 3.29% Senior Notes Series B due February 27, 2023. No principal payments are required until maturity. The Senior Notes Series A and Series B contain certain covenants on the part of the Company, including an interest coverage covenant, a debt-to-capitalization covenant and covenants relating to liens, asset sales and mergers, among others. The Senior Notes Series A and Series B also specify certain events of default, upon the occurrence of which the maturity of the notes may be accelerated, including failure to pay principal and interest, violation of covenants or default on other indebtedness, among others. As of December 31, 2018, the Company was in compliance with all Senior Notes Series A and Series B covenants and had \$150,000,000 of Senior Notes Series A outstanding and \$350,000,000 of Senior Notes Series B outstanding.

The Company has a \$10,000,000 line of credit (“Credit Line”) with Bank of America, N.A. (“Bank of America”) for short-term liquidity needs and letters of credit, with a maturity date of June 30, 2019. The Credit Line allows the Company to borrow at an interest rate agreed to by Bank of America and the Company at the time each borrowing is made or continued. The Company had no borrowings outstanding under the Credit Line as of December 31, 2018. Outstanding letters of credit under the Credit Line were \$1,171,000 as of December 31, 2018.

On September 13, 2017, as a result of the S&S acquisition, the Company assumed \$12,135,000 of term debt which was paid off without penalty in the 2017 fourth quarter.

Capital Expenditures Reflected on the Balance Sheet

Capital expenditures for 2018 were \$318,302,000, including \$26,172,000 for inland tank barge and towboat construction, \$41,653,000 for progress payments on six 5000 horsepower coastal ATB tugboats, \$71,660,000 for a 155,000 barrel coastal ATB under construction purchased from another operator that was delivered to the Company in the 2018 fourth quarter, and \$178,817,000 primarily for upgrading existing marine equipment and marine transportation and distribution and services facilities.

Capital expenditures for 2017 were \$171,697,000, including \$17,906,000 for inland tank barge and towboat construction, \$9,375,000 for progress payments on the construction of a 155,000 barrel coastal ATB placed in service in the 2017 third quarter, \$17,842,000 for progress payments on the construction of two 4900 horsepower coastal tugboats, one placed in service in the 2017 second quarter and the second placed in service in the 2017 fourth quarter, \$25,917,000 for progress payments on six 5000 horsepower coastal ATB tugboats, \$698,000 in final costs for the construction of a 35,000 barrel coastal petrochemical tank barge, and \$99,959,000 primarily for upgrading existing marine equipment and marine transportation and distribution and services facilities.

Financing of the construction of the inland tank barges and towboats and coastal tank barges and tugboats plus upgrades of existing equipment and marine transportation and distribution and services facilities was through operating cash flows and available credit under the Company's Revolving Credit Facility.

During 2018, the Company took delivery of one new inland tank barge with a capacity of approximately 29,000 barrels, acquired 163 inland tank barges with the Higman acquisition with a total capacity of approximately 4,766,000 barrels, acquired 27 inland tank barges from CGBM with a total capacity of approximately 306,000 barrels, acquired 16 pressure barges from Targa with a total capacity of approximately 258,000 barrels, acquired two inland tank barges with a total capacity of approximately 35,000 barrels, chartered one inland tank barge with a capacity of approximately 11,000 barrels, and retired 48 inland tank barges, reducing its capacity by approximately 846,000 barrels. The net result was an increase of 162 inland tank barges and approximately 4,559,000 barrels of capacity during 2018.

The Company projects that capital expenditures for 2019 will be in the \$225,000,000 to \$245,000,000 range. The 2019 construction program will consist of progress payments on the construction of 15 inland towboats, eight of which will be placed in service in 2019 and the remaining seven in 2020, and progress payments on the construction of three 5000 horsepower coastal ATB tugboats to be placed in service in 2019. Based on current commitments, steel prices and projected delivery schedules, the Company's 2019 progress payments on the new inland towboats will be approximately \$27,000,000 and 2019 progress payments on the construction of the three 5000 horsepower coastal ATB tugboats will be approximately \$18,000,000. Approximately \$155,000,000 to \$165,000,000 is primarily capital upgrades and improvements to existing marine equipment and facilities. The balance of \$25,000,000 to \$35,000,000 will be for rental fleet growth, new machinery and equipment, and facilities improvements in the distribution and services segment.

Funding for future capital expenditures is expected to be provided through operating cash flows and available credit under the Company's Revolving Credit Facility.

Treasury Stock Purchases

During October 2018, the Company purchased 11,000 shares of its common stock for \$776,000, for an average price of \$69.61 per share pursuant to a stock trading plan entered into with a brokerage firm pursuant to Rule 10b5-1 under the Securities Exchange Act of 1934. The Company did not purchase any treasury stock during 2017. As of February 22, 2019, the Company had approximately 1,400,000 shares available under its existing repurchase authorizations. Historically, treasury stock purchases have been financed through operating cash flows and borrowings under the Company's Revolving Credit Facility. The Company is authorized to purchase its common stock on the New York Stock Exchange and in privately negotiated transactions. When purchasing its common stock, the Company is subject to price, trading volume and other market considerations. Shares purchased may be used for reissuance upon the exercise of stock options or the granting of other forms of incentive compensation, in future acquisitions for stock or for other appropriate corporate purposes.

Liquidity

The Company generated net cash provided by operating activities of \$346,999,000, \$353,378,000 and \$415,794,000 for the years ended December 31, 2018, 2017 and 2016, respectively. The 2018 year experienced a net decrease in cash flows from changes in operating assets and liabilities of \$117,387,000 compared with a net decrease in the 2017 year of \$51,951,000. The net decrease in cash flows from the change in operating assets and liabilities was primarily due to higher inventories, including work in process, in the distribution and services oil and gas market during 2018, primarily to support the increased business activity levels, partially offset by a decrease in trade receivables due to a decrease in revenues recognized in the distribution and services oil and gas market in the 2018 fourth quarter driven by lower demand for new and overhauled transmissions and related parts and remanufactured pressure pumping units from some key oilfield customers. The 2016 year experienced a net decrease in cash flows from changes in operating assets and liabilities of \$10,696,000.

Funds generated from operations are available for acquisitions, capital expenditure projects, common stock repurchases, repayments of borrowings and for other corporate and operating requirements. In addition to net cash flow provided by operating activities, the Company also had available as of February 22, 2019, \$398,600,000 under its Revolving Credit Facility and \$8,829,000 available under its Credit Line.

Neither the Company, nor any of its subsidiaries, is obligated on any debt instrument, swap agreement, or any other financial instrument or commercial contract which has a rating trigger, except for pricing grids on its Revolving Credit Facility.

The Company expects to continue to fund expenditures for acquisitions, including Cenac, capital construction projects, common stock repurchases, repayment of borrowings, and for other operating requirements from a combination of available cash and cash equivalents, funds generated from operating activities and available financing arrangements.

The Revolving Credit Facility's commitment is in the amount of \$850,000,000 and expires June 26, 2022. As of December 31, 2018, the Company had \$425,839,000 available under the Revolving Credit Facility. The Senior Notes Series A and Senior Notes Series B do not mature until February 27, 2020 and February 27, 2023, respectively, and require no prepayments. The 2028 Notes do not mature until March 1, 2028 and require no prepayments.

There are numerous factors that may negatively impact the Company's cash flow in 2019. For a list of significant risks and uncertainties that could impact cash flows, see Note 15, Contingencies and Commitments in the financial statements, and Item 1A — Risk Factors. Amounts available under the Company's existing financing arrangements are subject to the Company continuing to meet the covenants of the credit facilities as described in Note 7, Long-Term Debt in the financial statements.

The Company has issued guaranties or obtained standby letters of credit and performance bonds supporting performance by the Company and its subsidiaries of contractual or contingent legal obligations of the Company and its subsidiaries incurred in the ordinary course of business. The aggregate notional value of these instruments is \$20,133,000 at December 31, 2018, including \$8,179,000 in letters of credit and \$11,954,000 in performance bonds. All of these instruments have an expiration date within two years. The Company does not believe demand for payment under these instruments is likely and expects no material cash outlays to occur in connection with these instruments.

All marine transportation term contracts contain fuel escalation clauses, or the customer pays for the fuel. However, there is generally a 30 to 90 day delay before contracts are adjusted depending on the specific contract. In general, the fuel escalation clauses are effective over the long-term in allowing the Company to recover changes in fuel costs due to fuel price changes. However, the short-term effectiveness of the fuel escalation clauses can be affected by a number of factors including, but not limited to, specific terms of the fuel escalation formulas, fuel price volatility, navigating conditions, tow sizes, trip routing, and the location of loading and discharge ports that may result in the Company over or under recovering its fuel costs. Spot contract rates generally reflect current fuel prices at the time the contract is signed but do not have escalators for fuel.

During the last three years, inflation has had a relatively minor effect on the financial results of the Company. The marine transportation segment has long-term contracts which generally contain cost escalation clauses whereby certain costs, including fuel as noted above, can be passed through to its customers. Spot contract rates include the cost of fuel and are subject to market volatility. The repair portion of the distribution and services segment is based on prevailing current market rates.

Contractual Obligations

The contractual obligations of the Company and its subsidiaries at December 31, 2018 consisted of the following (in thousands):

	Payments Due By Period				
	Total	Less Than 1 Year	2-3 Years	4-5 Years	After 5 Years
Long-term debt	\$ 1,417,392	\$ 19	\$ 150,000	\$ 767,373	\$ 500,000
Non-cancelable operating leases — barges	30,602	6,808	9,528	7,168	7,098
Non-cancelable operating leases — towing vessels	95,262	70,759	10,324	5,156	9,023
Non-cancelable operating leases — land, buildings and equipment	152,738	19,524	32,028	25,368	75,818
Barge and towing vessel construction contracts	30,634	30,634	—	—	—
Leased barges buyout commitments	8,340	8,340	—	—	—
	<u>\$ 1,734,968</u>	<u>\$ 136,084</u>	<u>\$ 201,880</u>	<u>\$ 805,065</u>	<u>\$ 591,939</u>

Approximately 75% of the towboat charter agreements are for terms of one year or less. The Company’s towboat rental agreements provide the Company with the option to terminate most agreements with notice ranging from seven to 90 days. The Company estimates that 80% of the charter rental cost is related to towboat crew costs, maintenance and insurance.

The Company’s pension plan funding strategy is to make annual contributions in amounts equal to or greater than amounts necessary to meet minimum government funding requirements. The ABO is based on a variety of demographic and economic assumptions, and the pension plan assets’ returns are subject to various risks, including market and interest rate risk, making an accurate prediction of the pension plan contribution difficult resulting in the Company electing to only make an expected pension contribution forecast of one year. As of December 31, 2018, the Company’s pension plan funding was 85% of the pension plans’ ABO, including the Higman pension plan. The Company expects to make pension contributions of \$2,395,000 in 2019 for the 2019 plan year.

Accounting Standards

In August 2018, the Financial Accounting Standards Board (“FASB”) issued ASU 2018-14, “Compensation – Retirement Benefits - Defined Benefit Plans – General (Subtopic 715-20): Disclosure Framework – Changes to the Disclosure Requirements for Defined Benefit Plans” which amends the annual disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans by removing certain requirements, providing clarification on existing requirements and adding new requirements including adding an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. The guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020. Early adoption is permitted. The amendments in this update are required to be applied on a retrospective basis to all periods presented. The Company is currently evaluating this guidance to determine the impact on its disclosures.

In February 2018, the FASB issued ASU 2018-02, “Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income” which allows a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the recent federal tax reform legislation. ASU 2018-02 eliminates the stranded tax effects resulting from the recent federal tax reform legislation and will improve the usefulness of information reported to financial statement users. The amendments in ASU 2018-02 will be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the recent federal tax reform legislation is recognized. ASU 2018-02 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2018. Early adoption is permitted, including adoption in any interim period, for which financial statements have not yet been made available for issuance. The Company elected to early adopt ASU 2018-02 in the 2018 first quarter, which resulted in the reclassification of \$7,925,000 from accumulated other comprehensive income (loss) to retained earnings due to the change in the federal corporate tax rate.

In March 2017, the FASB issued ASU 2017-07, “Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost” (“ASU 2017-07”) which requires employers to include only the service cost component of net periodic pension cost and net periodic postretirement benefit cost in operating expenses. The other components of net benefit cost are required to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations. The standard allows only the service cost component to be eligible for capitalization when applicable. ASU 2017-07 is effective for annual and interim periods beginning after December 15, 2017 with early adoption permitted. This standard shall be applied retrospectively for the presentation of the service cost component and the other components of net periodic pension cost and net periodic postretirement benefit cost in the income statement and prospectively for the capitalization of the service cost benefit in assets. The Company adopted ASU 2017-07 on January 1, 2018 and applied the standard retrospectively. The other components of net benefit cost are shown in Note 11, Retirement Plans. As a result of the adoption, the Company reclassified income of \$621,000 for 2017 and expense of \$2,175,000 for 2016 from operating expense into non-operating expense in the condensed statement of earnings.

In January 2017, the FASB issued ASU 2017-04, “Intangibles – Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment” (“ASU 2017-04”) which simplifies the subsequent measurement of goodwill by eliminating Step 2 in the goodwill impairment test that required an entity to perform procedures to determine the fair value of its assets and liabilities at the testing date. An entity instead will perform its annual, or interim, goodwill impairment test by comparing the fair value of a reporting unit with its carrying value and record an impairment charge based on the excess of a reporting unit’s carrying amount over its fair value. An entity still has the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. ASU 2017-04 will be applied prospectively and is effective for annual and interim goodwill impairment tests conducted in fiscal years beginning after December 15, 2019. Early adoption is permitted for interim or annual goodwill impairment testing dates after January 1, 2017. The Company is currently evaluating the impact, if any, that the adoption of this standard will have on its consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments” (“ASU 2016-15”) to create consistency in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. ASU 2016-15 is effective for annual and interim periods beginning after December 15, 2017. Early adoption is permitted. The Company adopted ASU 2016-15 on January 1, 2018 and the adoption of the standard did not have a material impact on the consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, “Leases (Topic 842)” (“ASU 2016-02”) to increase transparency and comparability among organizations by requiring recognition of lease assets and lease liabilities on the balance sheet and disclosure of key information about leasing arrangements. The Company will adopt ASU 2016-02 on January 1, 2019 under the optional transition method that allows for a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption and will not restate prior periods. The Company will also elect certain practical expedients permitted under the transition guidance. While the Company is continuing to assess the potential impacts of ASU 2016-02, the Company estimates that the adoption of ASU 2016-02 will result in the recognition of right-of-use assets for operating leases of approximately \$180,000,000 and lease liabilities for operating leases of approximately \$185,000,000 on its Consolidated Balance Sheets, with no material impact to its Consolidated Statements of Earnings or Cash Flows. The Company does not have any financing leases as of January 1, 2019.

In May 2014, the FASB issued ASU 2014-09, “Revenue from Contracts with Customers (ASC Topic 606)” (“ASU 2014-09” or “ASC 606”). ASU 2014-09 requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of promised goods or services to customers. ASU 2014-09 replaces most existing revenue recognition guidance in United States Generally Accepted Accounting Principles and is effective for fiscal years, and interim periods within those years, beginning after December 15, 2017. ASU 2014-09 permits the use of either the retrospective, modified retrospective or prospective with a cumulative catch-up approach. The Company adopted ASU 2014-09 on January 1, 2018 under the modified retrospective approach with a cumulative adjustment that decreased the opening balance of retained earnings by \$9,722,000. Prior period amounts were not adjusted and the prior period amounts continue to be reported under the accounting standards in effect for those periods. The cumulative adjustment primarily relates to recognition of revenue on certain contract manufacturing activities, primarily construction of new pressure pumping units in the Company’s distribution and services segment. The Company previously recognized revenue on manufacturing and assembly projects on a percentage of completion method using measurements of progress towards completion appropriate for the work performed. Upon the adoption of ASU 2014-09, the Company recognizes the revenues on contract manufacturing activities upon shipment and transfer of control versus the percentage of completion method.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

The Company is exposed to risk from changes in interest rates on certain of its outstanding debt. The outstanding loan balances under the Company's bank credit facilities bear interest at variable rates based on prevailing short-term interest rates in the United States and Europe. A 10% change in variable interest rates would impact the 2019 interest expense by \$507,000 based on balances outstanding at December 31, 2018, and would change the fair value of the Company's debt by 1%.

Item 8. Financial Statements and Supplementary Data

The response to this item is submitted as a separate section of this report (see Item 15, page 105).

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

Not applicable.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures. The Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended ("Exchange Act")) are designed to ensure that information required to be disclosed in the reports that are filed or submitted under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the rules and forms of the Securities and Exchange Commission and to ensure that such information required to be disclosed is accumulated and communicated to management, including principal executive and financial officers, as appropriate to allow timely decisions regarding required disclosure. The Chief Executive Officer ("CEO") and the Chief Financial Officer ("CFO"), with assistance from other members of management, have evaluated the effectiveness of the Company's disclosure controls and procedures as of December 31, 2018 and, based on their evaluation, the CEO and CFO have concluded that the disclosure controls and procedures were not effective as of such date due to the material weakness in internal control over financial reporting, described below.

Following identification of the material weakness described below, and prior to filing this Annual Report on Form 10-K, the Company completed substantive procedures for the year ended December 31, 2018. These procedures included additional analysis and post-closing procedures in light of the material weakness. Notwithstanding the material weakness, the Company performed review and lookback procedures and has not detected any unauthorized access to its financial applications nor discovered any inaccurate accounting entries or errors in financial reporting. These procedures were limited to one of the Company's recently acquired subsidiaries where the material weakness is present.

Based on these procedures, management has concluded that, notwithstanding the material weakness described below, the consolidated financial statements included in this Form 10-K have been prepared in accordance with U.S. GAAP and the CEO and CFO have certified that, based on their knowledge, the consolidated financial statements, and other financial information included in this Form 10-K, fairly present in all material respects the financial condition, results of operations and cash flows of the Company as of, and for, the periods presented in this Form 10-K. KPMG LLP, the Company's independent registered public accounting firm, has issued an unqualified opinion on the consolidated financial statements, which appears herein.

Management's Report on Internal Control Over Financial Reporting. Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act). The Company's management, with the participation of the CEO and the CFO, evaluated the effectiveness of the Company's internal control over financial reporting as of December 31, 2018 using the framework in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on that evaluation, management concluded that the Company's internal control over financial reporting was not effective as of December 31, 2018 due to the material weakness in internal control over financial reporting, described below.

The Company's assessment of changes in internal control related to a recently acquired subsidiary's information technology general controls did not timely identify inappropriate user access issues at the subsidiary. Specifically, the Company did not design and maintain user access controls that adequately restricted user and privileged access to certain IT operating systems, databases and IT applications at this subsidiary. As a result, process level automated controls and manual controls that are dependent on the completeness and accuracy of information derived from the affected IT systems were also ineffective because they could have been adversely impacted.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis. The Company did not identify any misstatements to the financial statements as a result of this material weakness.

KPMG LLP, the Company's independent registered public accounting firm, has issued an adverse audit report on the effectiveness of the Company's internal control over financial reporting as of December 31, 2018, which appears in Item 8 on page 65 of this Form 10-K.

Changes in Internal Control Over Financial Reporting. Except for the material weakness identified during the quarter, there were no changes in the Company's internal control over financial reporting during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Remediation Plan. The Company expects that all privileged access rights will be removed in the second quarter of 2019 and the Company will be required to test the affected IT operating systems, databases and applications. The Company believes that these actions and appropriate testing of its effectiveness will remediate this material weakness.

PART III

Items 10 Through 14.

The information for these items is incorporated by reference to the definitive proxy statement filed by the Company with the Commission pursuant to Regulation 14A within 120 days of the close of the fiscal year ended December 31, 2018, except for the information regarding executive officers which is provided under Item 1.

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Kirby Corporation:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Kirby Corporation and consolidated subsidiaries (the Company) as of December 31, 2018 and 2017, the related consolidated statements of earnings, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have 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, 2018, 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 25, 2019 expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in note 1 to the consolidated financial statements, the Company has changed its method of accounting for recognizing revenues in 2018 due to the adoption of Accounting Standard Update 2014-09, *Revenue from Contracts with Customers (ASC Topic 606)*, as amended.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated 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 consolidated 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 consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 1992.

Houston, Texas
February 25, 2019

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Kirby Corporation:

Opinion on Internal Control Over Financial Reporting

We have audited Kirby Corporation and consolidated subsidiaries' (the Company) internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, because of the effect of the material weakness, described below, on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, the related consolidated statements of earnings, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and our report dated February 25, 2019 expressed an unqualified opinion on those consolidated financial statements.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. A material weakness related to the Company's assessment of changes in internal control related to a recently acquired subsidiary's information technology general controls which did not timely identify inappropriate user access issues at the subsidiary has been identified and included in management's assessment. Specifically, the Company did not design and maintain user access controls that adequately restricted user and privileged access to certain IT operating systems, databases and IT applications at this subsidiary. As a result, process level automated controls and manual controls that are dependent on the completeness and accuracy of information derived from the affected IT systems were also ineffective because they could have been adversely impacted. The material weakness was considered in determining the nature, timing, and extent of audit tests applied in our audit of the 2018 consolidated financial statements, and this report does not affect our report on those consolidated 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 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 of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

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

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

/s/ KPMG LLP

Houston, Texas
February 25, 2019

KIRBY CORPORATION AND CONSOLIDATED SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

December 31, 2018 and 2017

	<u>2018</u>	<u>2017</u>
	(\$ in thousands)	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 7,800	\$ 20,102
Accounts receivable:		
Trade — less allowance for doubtful accounts of \$10,024 (\$8,930 in 2017)	417,644	452,222
Other	104,239	106,231
Inventories — at lower of average cost or market	507,441	315,729
Prepaid expenses and other current assets	59,365	62,798
Total current assets	<u>1,096,489</u>	<u>957,082</u>
Property and equipment:		
Marine transportation equipment	4,477,718	3,848,334
Land, buildings and equipment	534,106	512,548
	<u>5,011,824</u>	<u>4,360,882</u>
Accumulated depreciation	1,472,022	1,401,617
Property and equipment — net	<u>3,539,802</u>	<u>2,959,265</u>
Investment in affiliates	2,495	1,890
Goodwill	953,826	935,135
Other intangibles, net	224,197	232,808
Other assets	54,785	41,247
Total assets	<u>\$ 5,871,594</u>	<u>\$ 5,127,427</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Bank notes payable	\$ 19	\$ 3
Income taxes payable	2,794	191
Accounts payable	278,057	222,005
Accrued liabilities:		
Interest	13,171	6,099
Insurance premiums and claims	109,634	108,651
Employee compensation	53,089	45,193
Taxes — other than on income	38,680	22,791
Other	32,215	27,026
Deferred revenues	80,123	48,347
Total current liabilities	<u>607,782</u>	<u>480,306</u>
Long-term debt — less current portion	1,410,169	992,403
Deferred income taxes	542,785	468,451
Other long-term liabilities	94,557	72,044
Total long-term liabilities	<u>2,047,511</u>	<u>1,532,898</u>
Contingencies and commitments	—	—
Equity:		
Kirby stockholders' equity:		
Common stock, \$.10 par value per share. Authorized 120,000,000 shares, issued 65,472,000 in 2018 and 2017	6,547	6,547
Additional paid-in capital	823,347	802,961
Accumulated other comprehensive income — net	(33,511)	(32,405)
Retained earnings	2,723,592	2,646,937
Treasury stock — at cost, 5,608,000 shares in 2018 and 5,783,000 shares in 2017	(306,788)	(313,220)
Total Kirby stockholders' equity	<u>3,213,187</u>	<u>3,110,820</u>
Noncontrolling interests	3,114	3,403
Total equity	<u>3,216,301</u>	<u>3,114,223</u>
Total liabilities and equity	<u>\$ 5,871,594</u>	<u>\$ 5,127,427</u>

See accompanying notes to consolidated financial statements.

KIRBY CORPORATION AND CONSOLIDATED SUBSIDIARIES
CONSOLIDATED STATEMENTS OF EARNINGS
For the Years Ended December 31, 2018, 2017 and 2016

	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(\$ in thousands, except per share amounts)		
Revenues:			
Marine transportation	\$ 1,483,143	\$ 1,324,106	\$ 1,471,893
Distribution and services	1,487,554	890,312	298,780
Total revenues	<u>2,970,697</u>	<u>2,214,418</u>	<u>1,770,673</u>
Costs and expenses:			
Costs of sales and operating expenses	2,160,946	1,558,098	1,124,666
Selling, general and administrative	304,397	220,452	174,863
Taxes, other than on income	39,251	29,163	22,730
Depreciation and amortization	224,972	202,881	200,917
Impairment of long-lived assets	82,705	105,712	—
Impairment of goodwill	2,702	—	—
Lease cancellation costs	2,403	—	—
Loss (gain) on disposition of assets	(1,968)	4,487	127
Total costs and expenses	<u>2,815,408</u>	<u>2,120,793</u>	<u>1,523,303</u>
Operating income	155,289	93,625	247,370
Equity in earnings of affiliates	355	291	532
Other income (expense)	5,371	570	(2,466)
Interest expense	(46,856)	(21,472)	(17,690)
Earnings before taxes on income	114,159	73,014	227,746
Benefit (provision) for taxes on income	(35,081)	240,889	(84,942)
Net earnings	79,078	313,903	142,804
Less: Net earnings attributable to noncontrolling interests	(626)	(716)	(1,398)
Net earnings attributable to Kirby	<u>\$ 78,452</u>	<u>\$ 313,187</u>	<u>\$ 141,406</u>
Net earnings per share attributable to Kirby common stockholders:			
Basic	\$ 1.31	\$ 5.62	\$ 2.63
Diluted	\$ 1.31	\$ 5.62	\$ 2.62

See accompanying notes to consolidated financial statements.

KIRBY CORPORATION AND CONSOLIDATED SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

For the Years Ended December 31, 2018, 2017 and 2016

	<u>2018</u>	<u>2017</u>	<u>2016</u>
		(\$ in thousands)	
Net earnings	\$ 79,078	\$ 313,903	\$ 142,804
Other comprehensive income (loss), net of taxes:			
Pension and postretirement benefits	7,638	18,748	(6,321)
Foreign currency translation adjustments	(819)	(146)	—
Reclassification to retained earnings of stranded tax effects from tax reform	(7,925)	—	—
Total other comprehensive income (loss), net of taxes	<u>(1,106)</u>	<u>18,602</u>	<u>(6,321)</u>
Total comprehensive income, net of taxes	77,972	332,505	136,483
Net earnings attributable to noncontrolling interests	(626)	(716)	(1,398)
Comprehensive income attributable to Kirby	<u>\$ 77,346</u>	<u>\$ 331,789</u>	<u>\$ 135,085</u>

See accompanying notes to consolidated financial statements.

KIRBY CORPORATION AND CONSOLIDATED SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
For the Years Ended December 31, 2018, 2017 and 2016

	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(\$ in thousands)		
Cash flows from operating activities:			
Net earnings	\$ 79,078	\$ 313,903	\$ 142,804
Adjustments to reconcile net earnings to net cash provided by operations:			
Depreciation and amortization	224,972	202,881	200,917
Provision (credit) for doubtful accounts	1,289	224	(467)
Provision (benefit) for deferred income taxes	34,881	(256,263)	51,296
Loss (gain) on disposition of assets	(1,968)	4,487	127
Equity in earnings of affiliates, net of distributions and contributions	(355)	732	(532)
Impairment of long-lived assets	82,705	105,712	—
Impairment of goodwill	2,702	—	—
Amortization of unearned share-based compensation	19,104	11,460	11,675
Amortization of major maintenance costs	20,760	21,207	19,869
Amortization of debt issuance costs	1,218	986	801
Increase (decrease) in cash flows resulting from changes in:			
Accounts receivable	12,511	(60,405)	(12,750)
Inventory	(144,685)	19,673	3,182
Other assets	(38,090)	(17,049)	(30,853)
Income taxes payable	(457)	(11,823)	15,413
Accounts payable	22,622	20,758	(1,739)
Accrued and other liabilities	30,712	(3,105)	16,051
Net cash provided by operating activities	<u>346,999</u>	<u>353,378</u>	<u>415,794</u>
Cash flows from investing activities:			
Capital expenditures	(301,861)	(177,222)	(231,066)
Acquisitions of businesses and marine equipment, net of cash acquired	(533,897)	(470,101)	(137,072)
Proceeds from disposition of assets	53,392	54,229	18,617
Other	(250)	—	—
Net cash used in investing activities	<u>(782,616)</u>	<u>(593,094)</u>	<u>(349,521)</u>
Cash flows from financing activities:			
Borrowings (payments) on bank credit facilities, net	(78,455)	269,859	(52,848)
Borrowings (payments) on long-term debt	499,295	(13,721)	—
Payment of debt issue costs	(4,276)	(1,243)	—
Return of investment to noncontrolling interests	(915)	(862)	(1,976)
Proceeds from exercise of stock options	13,264	3,039	321
Purchase of treasury stock	(776)	—	(1,827)
Payments related to tax withholding for share-based compensation	(4,822)	(2,881)	(1,756)
Acquisitions of noncontrolling interest	—	(7)	(8,438)
Net cash provided by (used in) financing activities	<u>423,315</u>	<u>254,184</u>	<u>(66,524)</u>
Increase (decrease) in cash and cash equivalents	(12,302)	14,468	(251)
Cash and cash equivalents, beginning of year	20,102	5,634	5,885
Cash and cash equivalents, end of year	<u>\$ 7,800</u>	<u>\$ 20,102</u>	<u>\$ 5,634</u>
Supplemental disclosures of cash flow information:			
Cash paid during the period:			
Interest paid	\$ 40,772	\$ 21,663	\$ 19,878
Income taxes paid	\$ 640	\$ 27,196	\$ 18,162
Capital expenditures included in accounts payable	\$ (16,441)	\$ 5,525	\$ (2,037)
Non-cash investing activity:			
Fair value of property transferred in acquisition	\$ —	\$ —	\$ 3,681
Stock issued in acquisition	\$ —	\$ 366,554	\$ —
Cash acquired in acquisition	\$ 2,313	\$ 98	\$ —
Debt assumed in acquisition	\$ —	\$ 13,724	\$ —

See accompanying notes to consolidated financial statements.

KIRBY CORPORATION AND CONSOLIDATED SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
For the Years Ended December 31, 2018, 2017 and 2016

	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(\$ in thousands)		
Common stock:			
Balance at beginning of year	\$ 6,547	\$ 5,978	\$ 5,978
Issuance of shares in acquisition	—	569	—
Balance at end of year	<u>\$ 6,547</u>	<u>\$ 6,547</u>	<u>\$ 5,978</u>
Additional paid-in capital:			
Balance at beginning of year	\$ 802,961	\$ 432,459	\$ 434,783
Issuance of shares in acquisition	—	365,985	—
Excess (deficit) of proceeds received upon exercise of stock options and issuance of restricted stock over cost of treasury stock issued	3,489	833	(755)
Tax expense realized from equity compensation plans	—	—	(824)
Issuance of restricted stock, net of forfeitures	(2,207)	(7,770)	(10,218)
Amortization of unearned compensation	19,104	11,460	11,675
Acquisitions of noncontrolling interests	—	(6)	(2,202)
Balance at end of year	<u>\$ 823,347</u>	<u>\$ 802,961</u>	<u>\$ 432,459</u>
Accumulated other comprehensive income:			
Balance at beginning of year	\$ (32,405)	\$ (51,007)	\$ (44,686)
Cumulative effect of adoption of ASU 2018-02	\$ (7,925)	\$ —	\$ —
Other comprehensive income (loss), net of taxes	6,819	18,602	(6,321)
Balance at end of year	<u>\$ (33,511)</u>	<u>\$ (32,405)</u>	<u>\$ (51,007)</u>
Retained earnings:			
Balance at beginning of year	\$ 2,646,937	\$ 2,342,236	\$ 2,200,830
Cumulative effect of adoption of ASU 2016-09	—	(8,486)	—
Cumulative effect of adoption of ASU 2014-09	(9,722)	—	—
Cumulative effect of adoption of ASU 2018-02	7,925	—	—
Net earnings attributable to Kirby for the year	78,452	313,187	141,406
Balance at end of year	<u>\$ 2,723,592</u>	<u>\$ 2,646,937</u>	<u>\$ 2,342,236</u>
Treasury stock:			
Balance at beginning of year	\$ (313,220)	\$ (320,348)	\$ (328,094)
Purchase of treasury stock (11,000 in 2018 and 35,000 in 2016)	(776)	—	(1,827)
Cost of treasury stock issued upon exercise of stock options and issuance of restricted stock (186,000 in 2018, 138,000 in 2017 and 170,000 in 2016)	7,208	7,128	9,573
Balance at end of year	<u>\$ (306,788)</u>	<u>\$ (313,220)</u>	<u>\$ (320,348)</u>
Noncontrolling interests:			
Balance at beginning of year	\$ 3,403	\$ 3,549	\$ 10,385
Net earnings attributable to noncontrolling interests	626	716	1,398
Return of investment to noncontrolling interests	(915)	(862)	(1,976)
Acquisitions of noncontrolling interests	—	—	(6,258)
Balance at the end of year	<u>\$ 3,114</u>	<u>\$ 3,403</u>	<u>\$ 3,549</u>

See accompanying notes to consolidated financial statements.

KIRBY CORPORATION AND CONSOLIDATED SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(1) Summary of Significant Accounting Policies

Principles of Consolidation. The consolidated financial statements include the accounts of Kirby Corporation and all majority-owned subsidiaries (“the Company”). All investments in which the Company owns 20% to 50% and exercises significant influence over operating and financial policies are accounted for using the equity method. All material intercompany accounts and transactions have been eliminated in consolidation. Certain reclassifications have been made to reflect the current presentation of financial information.

Accounting Policies

Cash Equivalents. Cash equivalents consist of all short-term, highly liquid investments with maturities of three months or less at date of purchase.

Accounts Receivable. In the normal course of business, the Company extends credit to its customers. The Company regularly reviews the accounts and makes adequate provisions for probable uncollectible balances. It is the Company’s opinion that the accounts have no impairment, other than that for which provisions have been made. Included in accounts receivable as of December 31, 2018 and 2017 were \$114,159,000 and \$153,661,000, respectively, of accruals for revenues earned which have not been invoiced as of the end of each year.

The Company’s marine transportation and distribution and services operations are subject to hazards associated with such businesses. The Company maintains insurance coverage against these hazards with insurance companies. Included in accounts receivable as of December 31, 2018 and 2017 were \$69,624,000 and \$66,588,000, respectively, of receivables from insurance companies to cover claims in excess of the Company’s deductible.

Concentrations of Credit Risk. Financial instruments which potentially subject the Company to concentrations of credit risk are primarily trade accounts receivables. The Company’s marine transportation customers include the major oil refining and petrochemical companies. The distribution and services customers are oilfield service companies, oil and gas operators and producers, on-highway transportation companies, marine transportation companies, commercial fishing companies, construction companies, mining companies, power generation companies, and the United States government. The Company regularly reviews its accounts and estimates the amount of uncollectible receivables each period and establishes an allowance for uncollectible amounts. The amount of the allowance is based on the age of unpaid amounts, information about the current financial strength of customers, and other relevant information. Estimates of uncollectible amounts are revised each period, and changes are recorded in the period they become known.

Fair Value of Financial Instruments. Cash, accounts receivable, accounts payable and accrued liabilities have carrying values that approximate fair value due to the short-term maturity of these financial instruments. The fair value of the Company’s debt instruments is more fully described in Note 7, Long-Term Debt.

Property, Maintenance and Repairs. Property is recorded at cost or acquisition date fair value, Improvements and betterments are capitalized as incurred. Depreciation is recorded on the straight-line method over the estimated useful lives of the individual assets as follows: marine transportation equipment, 5-40 years; buildings, 10-40 years; other equipment, 2-10 years; and leasehold improvements, term of lease. When property items are retired, sold or otherwise disposed of, the related cost and accumulated depreciation are removed from the accounts with any gain or loss on the disposition included in the statement of earnings. Maintenance and repairs on vessels built for use on the inland waterways are charged to operating expense as incurred and includes the costs incurred in United States Coast Guard (“USCG”) inspections unless the shipyard extends the life or improves the operating capacity of the vessel which results in the costs being capitalized.

Drydocking on Ocean-Going Vessels. The Company's ocean-going vessels are subject to regulatory drydocking requirements after certain periods of time to be inspected, have planned major maintenance performed and be recertified by the American Bureau of Shipping ("ABS"). These recertifications generally occur twice in a five year period. The Company defers the drydocking expenditures incurred on its ocean-going vessels due to regulatory marine inspections by the ABS and amortizes the costs of the shipyard over the period between drydockings, generally 30 or 60 months, depending on the type of major maintenance performed. Drydocking expenditures that extend the life or improve the operating capability of the vessel result in the costs being capitalized. The Company recognized amortization of major maintenance costs of \$20,760,000, \$21,207,000 and \$19,869,000 for the years ended December 31, 2018, 2017 and 2016, respectively, in costs of sales and operating expenses. Routine repairs and maintenance on ocean-going vessels are expensed as incurred. Interest is capitalized on the construction of new ocean-going vessels. Interest expense excludes capitalized interest of \$2,206,000, \$1,731,000 and \$2,974,000 for the years ending December 31, 2018, 2017 and 2016, respectively.

Environmental Liabilities. The Company expenses costs related to environmental events as they are incurred or when a loss is considered probable and estimable.

Goodwill. The excess of the purchase price over the fair value of identifiable net assets acquired in transactions accounted for as a purchase is included in goodwill. The Company conducted its annual goodwill impairment test at November 30, 2018 and 2017. For 2018, the Company incurred an impairment of goodwill charge of \$2,702,000. For 2017, the Company noted no impairment of goodwill. The Company will continue to conduct goodwill impairment tests as of November 30 of subsequent years, or whenever events or circumstances indicate that interim impairment testing is necessary. The amount of goodwill impairment, if any, is typically measured based on projected discounted future operating cash flows using an appropriate discount rate. The gross carrying value of goodwill at December 31, 2018 and 2017 was \$973,995,000 and \$947,502,000, respectively, and accumulated amortization at December 31, 2018 and 2017 was \$15,566,000. Accumulated impairment losses were \$4,603,000 and \$1,901,000 at December 31, 2018 and December 31, 2017, respectively.

During the 2018 fourth quarter, the Company took a \$2,702,000 charge for the impairment of the remaining goodwill recorded for Osprey Line, L.L.C., a subsidiary that transports project cargoes and cargo containers by barge on the United States inland waterway system. The impairment reflected the reduced profitability outlook of the container-on-barge operations due to the current economic environment. The fair value was determined using a combination of a discounted cash flow methodology and a market based approach utilizing a net earnings before interest expense, taxes on income, depreciation and amortization (EBITDA) multiplier.

Net goodwill for the marine transportation segment was \$405,575,000 and \$387,504,000 at December 31, 2018 and 2017, respectively. The increase in net goodwill for the marine transportation segment for 2018 was due to the acquisitions of Higman Marine, Inc. and its affiliated companies ("Higman") and Targa Resources Corp.'s ("Targa") inland tank barge business, more fully described in Note 3, Acquisitions. Net goodwill for the distribution and services segment was \$548,251,000 and \$547,631,000 at December 31, 2018 and 2017, respectively.

Other Intangibles. Other intangibles include assets for favorable contracts and customer relationships, distributorship and dealership agreements, trade names and noncompete agreements and liabilities for unfavorable leases and contracts. As of December 31, 2018 and 2017, the gross carrying amounts of other intangible assets were \$326,984,000 and \$315,983,000, respectively, and the accumulated amortization was \$102,787,000 and \$83,175,000, respectively, resulting in net carrying amounts of \$224,197,000 and \$232,808,000, respectively. As of December 31, 2018 and 2017, the gross carrying amounts of other intangible liabilities were \$18,323,000 and \$7,437,000, respectively, and the accumulated amortization was \$8,652,000 and \$4,751,000, respectively, resulting in net carrying amounts of \$9,671,000 and \$2,686,000, respectively. The increase in other intangible liabilities in 2018 was due to the acquisition of Higman, more fully described in Note 3, Acquisitions.

The costs of intangible assets and liabilities are amortized to expense in a systematic and rational manner over their estimated useful lives.

For the years ended December 31, 2018, 2017 and 2016, the amortization expense for intangibles was \$16,760,000, \$11,296,000 and \$8,467,000, respectively. Estimated amortization expense for amortizable intangible assets and liabilities for the next five years (2019 – 2023) is approximately \$18,999,000, \$20,854,000, \$20,174,000, \$19,824,000 and \$19,782,000, respectively. As of December 31, 2018, the weighted average amortization period for intangible assets and liabilities was approximately 14 years.

Revenue Recognition. The majority of marine transportation revenue is derived from term contracts, ranging from one to three years, some of which have renewal options, and the remainder is from spot market movements. The majority of the term contracts are for terms of one year. The Company is a provider of marine transportation services for its customers and, in almost all cases, does not assume ownership of the products it transports. A term contract is an agreement with a specific customer to transport cargo from a designated origin to a designated destination at a set rate or at a daily rate. The rate may or may not escalate during the term of the contract, however, the base rate generally remains constant and contracts often include escalation provisions to recover changes in specific costs such as fuel. A spot contract is an agreement with a customer to move cargo from a specific origin to a designated destination for a rate negotiated at the time the cargo movement takes place. Spot contract rates are at the current "market" rate, including fuel, and are subject to market volatility. The Company uses a voyage accounting method of revenue recognition for its marine transportation revenues which allocates voyage revenue based on the percent of the voyage completed during the period.

Distribution products and services are generally sold based upon purchase orders or preferential service agreements with the customer that include fixed or determinable prices. Parts sales are recognized when control transfers to the customer, generally when title passes upon shipment to customers. Service revenue is recognized over time as the service is provided using measures of progress utilizing hours worked or costs incurred as a percentage of estimated hours or expected costs. Revenue from rental agreements is recognized on a straight-line basis over the rental period. The Company recognizes the revenues on contract manufacturing activities upon shipment and transfer of control to the customer. Prior to the adoption of Accounting Standards Update ("ASU") 2014-09, distribution and services manufacturing and assembly projects revenue was reported on the percentage of completion method of accounting using measurements of progress towards completion appropriate for the work performed.

Stock-Based Compensation. The Company has share-based compensation plans covering selected officers and other key employees as well as the Company's Board of Directors. Stock-based grants made under the Company's stock plans are recorded at fair value on the date of the grant and the cost for all grants made under the director plan and for grants made under the employee plan prior to February 19, 2018 is recognized ratably over the vesting period of the stock option or restricted stock. On February 19, 2018, the employee stock award plan was amended to also allow for the granting of restricted stock units ("RSUs") to selected officers and other key employees. The amendment included a provision for the continued vesting of unvested stock options and RSUs for employees who meet certain years of service and age requirements at the time of their retirement. The vesting change resulted in shorter expense accrual periods on stock options and RSUs granted after February 19, 2018 to employees who are nearing retirement and meet the service and age requirements. Stock option grants are valued at the date of grant as calculated under the Black-Scholes option pricing model. The Company's stock-based compensation plans are more fully described in Note 10, Stock Award Plans.

Taxes on Income. The Company follows the asset and liability method of accounting for income taxes. Under the asset and liability method, deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

Accrued Insurance. Accrued insurance liabilities include estimates based on individual incurred claims outstanding and an estimated amount for losses incurred but not reported ("IBNR") or fully developed based on past experience. Insurance premiums, IBNR losses and incurred claim losses, in excess of the Company's deductible for 2018, 2017 and 2016 were \$29,306,000, \$26,195,000 and \$23,085,000, respectively.

Treasury Stock. The Company follows the average cost method of accounting for treasury stock transactions.

Impairment of Long-lived Assets and for Long-lived Assets to Be Disposed Of. The Company reviews long-lived assets and certain identifiable intangibles for impairment by vessel class whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable.

Recoverability on marine transportation assets is assessed based on vessel classes, not on individual assets, because identifiable cash flows for individual marine transportation assets are not available. Projecting customer contract volumes allows estimation of future cash flows by projecting pricing and utilization by vessel class but it is not practical to project which individual marine transportation asset will be utilized for any given contract. Because customers do not specify which particular vessel is used, prices are quoted based on vessel classes not individual assets. Nominations of vessels for specific jobs are determined on a day by day basis and are a function of the equipment class required and the geographic position of vessels within that class at that particular time as vessels within a class are interchangeable and provide the same service. The Company's vessels are mobile assets and equipped to operate in geographic regions throughout the United States and the Company has in the past and expects to continue to move vessels from one region to another when it is necessary due to changing markets and it is economical to do so. Barge vessel classes are based on similar capacities, hull type, and type of product and towing vessels are based on similar hull type and horsepower. Recoverability of the vessel classes is measured by a comparison of the carrying amount of the assets to future net cash flows expected to be generated by the assets. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value of the assets. Assets to be disposed of are reported at the lower of the carrying amount or fair value less costs to sell.

Accounting Standards

In August 2018, the Financial Accounting Standards Board ("FASB") issued ASU 2018-14, "Compensation – Retirement Benefits - Defined Benefit Plans – General (Subtopic 715-20): Disclosure Framework – Changes to the Disclosure Requirements for Defined Benefit Plans" which amends the annual disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans by removing certain requirements, providing clarification on existing requirements and adding new requirements including adding an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. The guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020. Early adoption is permitted. The amendments in this update are required to be applied on a retrospective basis to all periods presented. The Company is currently evaluating this guidance to determine the impact on its disclosures.

In February 2018, the FASB issued ASU 2018-02, "Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income" which allows a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the recent federal tax reform legislation. ASU 2018-02 eliminates the stranded tax effects resulting from the recent federal tax reform legislation and will improve the usefulness of information reported to financial statement users. The amendments in ASU 2018-02 will be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the recent federal tax reform legislation is recognized. ASU 2018-02 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2018. Early adoption is permitted, including adoption in any interim period, for which financial statements have not yet been made available for issuance. The Company elected to early adopt ASU 2018-02 in the 2018 first quarter, which resulted in the reclassification of \$7,925,000 from accumulated other comprehensive income (loss) to retained earnings due to the change in the federal corporate tax rate.

In March 2017, the FASB issued ASU 2017-07, "Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost" ("ASU 2017-07") which requires employers to include only the service cost component of net periodic pension cost and net periodic postretirement benefit cost in operating expenses. The other components of net benefit cost are required to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations. The standard allows only the service cost component to be eligible for capitalization when applicable. ASU 2017-07 is effective for annual and interim periods beginning after December 15, 2017 with early adoption permitted. This standard shall be applied retrospectively for the presentation of the service cost component and the other components of net periodic pension cost and net periodic postretirement benefit cost in the income statement and prospectively for the capitalization of the service cost benefit in assets. The Company adopted ASU 2017-07 on January 1, 2018 and applied the standard retrospectively. The other components of net benefit cost are shown in Note 11, Retirement Plans. As a result of the adoption, the Company reclassified income of \$621,000 for 2017 and expense of \$2,175,000 for 2016 from operating expense into non-operating expense in the condensed statement of earnings.

In January 2017, the FASB issued ASU 2017-04, “Intangibles – Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment” (“ASU 2017-04”) which simplifies the subsequent measurement of goodwill by eliminating Step 2 in the goodwill impairment test that required an entity to perform procedures to determine the fair value of its assets and liabilities at the testing date. An entity instead will perform its annual, or interim, goodwill impairment test by comparing the fair value of a reporting unit with its carrying value and record an impairment charge based on the excess of a reporting unit’s carrying amount over its fair value. An entity still has the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. ASU 2017-04 will be applied prospectively and is effective for annual and interim goodwill impairment tests conducted in fiscal years beginning after December 15, 2019. Early adoption is permitted for interim or annual goodwill impairment testing dates after January 1, 2017. The Company is currently evaluating the impact, if any, that the adoption of this standard will have on its consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments” (“ASU 2016-15”) to create consistency in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. ASU 2016-15 is effective for annual and interim periods beginning after December 15, 2017. Early adoption is permitted. The Company adopted ASU 2016-15 on January 1, 2018 and the adoption of the standard did not have a material impact on the consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, “Leases (Topic 842)” (“ASU 2016-02”) to increase transparency and comparability among organizations by requiring recognition of lease assets and lease liabilities on the balance sheet and disclosure of key information about leasing arrangements. The Company will adopt ASU 2016-02 on January 1, 2019 under the optional transition method that allows for a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption and will not restate prior periods. The Company will also elect certain practical expedients permitted under the transition guidance. While the Company is continuing to assess the potential impacts of ASU 2016-02, the Company estimates that the adoption of ASU 2016-02 will result in the recognition of right-of-use assets for operating leases of approximately \$180,000,000 and lease liabilities for operating leases of approximately \$185,000,000 on its Consolidated Balance Sheets, with no material impact to its Consolidated Statements of Earnings or Cash Flows. The Company does not have any financing leases as of January 1, 2019.

In May 2014, the FASB issued ASU 2014-09, “Revenue from Contracts with Customers (ASC Topic 606)” (“ASU 2014-09” or “ASC 606”). ASU 2014-09 requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of promised goods or services to customers. ASU 2014-09 replaces most existing revenue recognition guidance in United States Generally Accepted Accounting Principles and is effective for fiscal years, and interim periods within those years, beginning after December 15, 2017. ASU 2014-09 permits the use of either the retrospective, modified retrospective or prospective with a cumulative catch-up approach. The Company adopted ASU 2014-09 on January 1, 2018 under the modified retrospective approach with a cumulative adjustment that decreased the opening balance of retained earnings by \$9,722,000. Prior period amounts were not adjusted and the prior period amounts continue to be reported under the accounting standards in effect for those periods. The cumulative adjustment primarily relates to recognition of revenue on certain contract manufacturing activities, primarily construction of new pressure pumping units in the Company’s distribution and services segment. The Company previously recognized revenue on manufacturing and assembly projects on a percentage of completion method using measurements of progress towards completion appropriate for the work performed. Upon the adoption of ASU 2014-09, the Company recognizes the revenues on contract manufacturing activities upon shipment and transfer of control versus the percentage of completion method.

The following tables summarize the financial statement line items within the Company's condensed consolidated financial statements impacted by ASU 2014-09 for the year ended December 31, 2018 (in thousands):

	2018		
	As Reported	Balances without Adoption of ASC 606	Effect of Change
Statements of earnings:			
Distribution and services revenues	\$ 1,487,554	\$ 1,515,554	\$ (28,000)
Costs of sales and operating expenses	\$ 2,160,946	\$ 2,181,046	\$ (20,100)
Operating income	\$ 155,289	\$ 163,189	\$ (7,900)
Earnings before taxes on income	\$ 114,159	\$ 122,059	\$ (7,900)
Provision for taxes on income	\$ (35,081)	\$ (37,187)	\$ 2,106
Net earnings attributable to Kirby	\$ 78,452	\$ 84,246	\$ (5,794)
Statements of comprehensive income:			
Net earnings	\$ 79,078	\$ 84,872	\$ (5,794)
Comprehensive income attributable to Kirby	\$ 77,346	\$ 83,140	\$ (5,794)
Statements of cash flows:			
Net earnings	\$ 79,078	\$ 84,872	\$ (5,794)
Provision for deferred income taxes	\$ 34,881	\$ 32,775	\$ 2,106
Decrease in cash flows resulting from changes in:			
Accounts receivable	\$ 12,511	\$ (71,624)	\$ 84,135
Inventory	\$ (144,685)	\$ (71,985)	\$ (72,700)
Accrued and other liabilities	\$ 30,712	\$ 38,459	\$ (7,747)

The following table summarizes the balance sheet line items within the Company's condensed consolidated financial statements as of December 31, 2018 impacted by ASU 2014-09 (in thousands):

	December 31, 2018		
	As Reported	Balances without Adoption of ASC 606	Effect of Change
Balance sheets:			
Trade receivables	\$ 417,644	\$ 501,779	\$ (84,135)
Inventories – net	\$ 507,441	\$ 434,741	\$ 72,700
Total assets	\$ 5,871,594	\$ 5,883,029	\$ (11,435)
Deferred revenues	\$ 80,123	\$ 70,858	\$ 9,265
Deferred income taxes	\$ 542,785	\$ 547,991	\$ (5,206)
Retained earnings	\$ 2,723,592	\$ 2,739,086	\$ (15,494)
Total liabilities and equity	\$ 5,871,594	\$ 5,883,029	\$ (11,435)

(2) Revenues

The following table sets forth the Company's revenues by major source for the years ended December 31, 2018, 2017 and 2016 (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Marine transportation segment:			
Inland transportation	\$ 1,119,820	\$ 923,916	\$ 951,097
Coastal transportation	363,323	400,190	520,796
	<u>\$ 1,483,143</u>	<u>\$ 1,324,106</u>	<u>\$ 1,471,893</u>
Distribution and services segment:			
Oil and gas	\$ 1,010,410	\$ 614,128	\$ 115,012
Commercial and industrial	477,144	276,184	183,768
	<u>\$ 1,487,554</u>	<u>\$ 890,312</u>	<u>\$ 298,780</u>

The Company's revenue is measured based on consideration specified in its contracts with its customers. The Company recognizes revenue as it satisfies performance obligations in its contracts which occur as the Company delivers a service over time to its customers, or transfers control over a part or product to its customer.

Marine Transportation Revenues. The Company's marine transportation segment utilizes contracts with its customers to transport cargo from a designated origin to a designated destination at a set rate or at a daily rate. The Company uses a voyage accounting method of revenue recognition for its marine transportation revenues which allocates voyage revenue based on the percent of the voyage completed during the period. The performance of the service is invoiced as the transaction occurs and payment is required depending on each specific customer's credit.

Distribution and Services Revenues. Distribution products and services are generally sold based upon purchase orders or preferential service agreements with the customer that include fixed or determinable prices. Parts sales are recognized when control transfers to the customer, generally when title passes upon shipment to customers. Service revenue is recognized over time as the service is provided using measures of progress utilizing hours worked or costs incurred as a percentage of estimated hours or expected costs. Revenue from rental agreements is recognized on a straight-line basis over the rental period. The Company recognizes the revenues on contract manufacturing activities upon shipment and transfer of control to the customer. The transactions in the distribution and services segment are typically invoiced as parts are shipped or upon the completion of the service job. Contract manufacturing activities are generally invoiced upon shipment and the Company will often get deposits from its customers prior to starting work, or progress payments during the project depending on the credit worthiness of the customer and the size of the project.

Prior to the adoption of ASU 2014-09, distribution and services manufacturing and assembly projects revenue was reported on the percentage of completion method of accounting using measurements of progress towards completion appropriate for the work performed. Upon the adoption of ASU 2014-09 on January 1, 2018, the Company recognizes the revenues on contract manufacturing activities upon shipment and transfer of control versus the percentage of completion method.

Contract Assets and Liabilities. Contract liabilities represent advance consideration received from customers, and are recognized as revenue over time as the related performance obligation is satisfied. The amount of revenue recognized in 2018 that was included in the opening contract liability balance was \$43,348,000. The Company has recognized all contract liabilities within the deferred revenues financial statement caption on the balance sheet. The Company expects to recognize revenue of \$80,123,000 in 2019 related to deferred revenue as of December 31, 2018. The Company did not have any contract assets at December 31, 2018 or December 31, 2017.

Performance Obligations. The Company applies the practical expedient in ASC 606-10-50-14(a) and does not disclose information about remaining performance obligations that have original expected durations of one year or less.

(3) Acquisitions

On December 28, 2018, the Company purchased three inland tank barges from a leasing company for \$3,120,000 in cash. The Company had been leasing the barges prior to the purchase.

On December 14, 2018, the Company purchased 27 inland tank barges with a barrel capacity of 306,000 barrels from CGBM 100, LLC for \$28,500,000 in cash. The 27 tank barges transport petrochemicals and refined products on the Mississippi River System and the Gulf Intracoastal Waterway. The average age of the barges was eight years.

On November 30, 2018, the Company purchased an inland towboat from a leasing company for \$3,050,000 in cash. The Company had been leasing the towboat prior to the purchase.

On May 10, 2018, the Company completed the purchase of Targa inland tank barge business from a subsidiary of Targa for \$69,250,000 in cash. Targa's inland tank barge fleet consisted of 16 pressure barges with a total capacity of 258,000 barrels, many of which were under multi-year contracts that the Company assumed from Targa. The 16 tank barges transport petrochemicals on the Mississippi River System and the Gulf Intracoastal Waterway. As a result of the acquisition, the Company recorded \$16,116,000 of goodwill and \$11,000,000 of intangibles with an average amortization period of 15 years. The Company expects all of the goodwill to be deductible for tax purposes.

On March 15, 2018, the Company purchased two inland pressure tank barges from a competitor for \$10,400,000 in cash. The average age of the two tank barges was five years.

On February 14, 2018, the Company completed the acquisition of Higman for \$421,922,000 in cash, subject to certain post-closing adjustments. Higman's fleet consisted of 163 inland tank barges with 4.8 million barrels of capacity, and 75 inland towboats, transporting petrochemicals, black oil, including crude oil and natural gas condensate, and refined petroleum products on the Mississippi River System and the Gulf Intracoastal Waterway. The average age of the inland tank barges was approximately seven years and the inland towboats had an average age of approximately eight years. Financing of the acquisition was through the issuance of \$500,000,000 of 4.2% senior unsecured notes due March 1, 2028 (the "2028 Notes"). The 2028 Notes were issued on February 12, 2018 in preparation for closing of the acquisition.

The Company considers Higman to be a natural extension of the current marine transportation segment, expanding the capabilities of the Company's inland based marine transportation business and lowering the average age of its inland tank barge and towboat fleet.

The fair values of the assets acquired and liabilities assumed recorded at the acquisition date were as follows (in thousands):

Assets:	
Cash	\$ 2,313
Accounts receivable	27,527
Prepaid expenses	5,323
Property and equipment	497,951
Goodwill	4,657
Other assets	30
Total assets	<u>\$ 537,801</u>
Liabilities:	
Accounts payable	17,012
Accrued liabilities	14,127
Deferred income taxes	40,524
Other long-term liabilities	44,216
Total liabilities	<u>\$ 115,879</u>
Net assets acquired	<u>\$ 421,922</u>

As a result of the acquisition, the Company recorded \$4,657,000 of goodwill of which the majority will be deductible for tax purposes. The Company also incurred \$11,100,000 of intangible liabilities related to unfavorable contracts with a weighted average amortization period of approximately 4.9 years. Acquisition related costs of \$3,464,000, consisting primarily of legal, audit and other professional fees plus other expenses, were expensed as incurred to selling, general and administrative expense in 2018.

On October 20, 2017, San Jac Marine, Inc. ("San Jac"), a subsidiary of the Company, purchased certain assets of Sneed Shipbuilding, Inc. for \$14,852,000 in cash including its Channelview, Texas shipyard. San Jac is a builder of marine vessels for both inland and offshore applications as well providing repair and maintenance services. The Company intends to build towboats at the shipyard and use the facilities for routine maintenance.

On September 13, 2017, the Company completed the acquisition of substantially all of the assets of Stewart & Stevenson LLC ("S&S"), a global manufacturer and distributor of products and services for the oil and gas, marine, construction, power generation, transportation, mining and agricultural industries. The acquired business, which the Company operates through a newly formed subsidiary renamed Stewart & Stevenson LLC after the closing of the acquisition, was founded in 1902 and serves domestic and global markets with equipment, rental solutions, parts and service through a strategic network of sales and service centers in domestic and international locations.

The total value of the transaction was \$758,213,000 consisting of cash consideration of \$377,935,000, the assumption of \$13,724,000 of debt and \$366,554,000 through the issuance of 5,696,259 shares of Company common stock valued at \$64.35 per share, the Company's closing share price on September 13, 2017. On June 26, 2017, in advance of the purchase of S&S, the Company entered into an amendment of its revolving credit facility that increased the borrowing limit from \$550,000,000 to \$850,000,000 and extended the maturity date to June 26, 2022. The debt assumed consisted of \$12,135,000 of term debt and \$1,589,000 of short-term secured loans related to the Company's South American operations. The term debt was paid off without penalty in the 2017 fourth quarter.

S&S, headquartered in Houston, Texas with 40 branches across 12 states, is a distributor in certain geographic areas for Allison Transmission, MTU, Detroit Diesel, EMD Power Products ("EMD"), Deutz and several other manufacturers. S&S' principal customers are oilfield service companies, oil and gas operators and producers, and companies in the marine, mining, power generation, on-highway and other commercial and industrial applications.

On July 10, 2017, the Company completed the purchase of certain inland marine assets from an undisclosed competitor for \$68,000,000 in cash. The assets purchased consisted of nine specialty pressure tank barges, four 30,000 barrel tank barges and three 1320 horsepower inland towboats. The average age of the 13 inland tank barges was five years. The 13 tank barges transport petrochemicals and refined petroleum products on the Mississippi River System and the Gulf Intracoastal Waterway. As a result of the acquisition, the Company recorded \$67,970,000 of property and \$30,000 of intangibles with a weighted average amortization period of two years.

During July 2017, the Company purchased four inland tank barges for \$1,450,000 as well as a barge fleeting and marine fueling operation business in Freeport, Texas for \$3,900,000. The Company had been leasing the barges prior to the purchase.

On October 11, 2016, the Company purchased certain assets of Valley Power Systems, Inc. and Valley Power Systems Northwest, Inc. (collectively “VPS”) for \$11,440,000 in cash. The assets purchased are mainly related to the EMD engine supply and repair business of VPS and include an EMD distributor agreement to sell engines in nine western states. As a result of the acquisition, the Company recorded \$8,330,000 of goodwill and \$2,070,000 of intangibles with a weighted average amortization period of approximately 15 years. The Company expects all of the goodwill to be deductible for tax purposes.

On June 30, 2016, the Company purchased an 80,000 barrel coastal tank barge from TD Equipment Finance, Inc. (“TD Equipment”) for \$13,682,000 in cash. The Company had been leasing the barge from TD Equipment prior to its purchase.

On June 2, 2016, the Company purchased four coastal tugboats from Crosby Marine Transportation LLC for \$26,450,000 in cash. The four coastal tugboats have an average age of 13 years.

On April 15, 2016, the Company purchased the inland tank barge fleet of SEACOR Holdings Inc. (“Seacor”) from subsidiaries of Seacor for a total value of \$89,181,000. The assets purchased consisted of 27 inland 30,000 barrel tank barges and 14 inland towboats. The purchase price was comprised of \$85,500,000 in cash and the transfer to Seacor of a Florida-based ship docking tugboat with a value of \$3,681,000. The average age of the 27 inland tank barges was ten years. Seacor, through its subsidiary, SCF Waxler Marine LLC, transported refined petroleum products, petrochemicals and black oil on the Mississippi River System and the Gulf Intracoastal Waterway. As a result of the acquisition, the Company recorded \$985,000 of goodwill and expects all of the goodwill to be deductible for tax purposes. No intangibles other than goodwill were identified in the acquisition.

The following unaudited pro forma results present consolidated information as if the S&S acquisition had been completed as of January 1, 2016. The pro forma results do not include any of the other acquisitions completed in 2016 through 2018 described above as the effect of these acquisitions would not be materially different from the Company’s actual results.

The pro forma results include the amortization associated with the acquired intangible assets, interest expense associated with the debt used to fund a portion of the acquisition, the impact of the additional shares issued in connection with the S&S acquisition, removal of a product line sold in 2016 and the impact of certain fair value adjustments such as depreciation adjustments related to adjustments to property and equipment. The pro forma results do not include any cost savings or potential synergies related to the acquisition nor any integration costs. The pro forma results should not be considered indicative of the results of operations or financial position of the combined companies had the acquisitions had been consummated as of January 1, 2016 and are not necessarily indicative of results of future operations of the Company.

The following table sets forth the Company’s pro forma revenues and net earnings attributable to Kirby for the years ended December 31, 2016 and 2017 (unaudited and in thousands):

	2016	2017
	Pro forma	Pro forma
Revenues	\$ 2,299,800	\$ 2,556,131
Net earnings attributable to Kirby	\$ 125,197	\$ 303,097

(4) Impairment of Long-lived Assets

During the fourth quarter of 2018, the Company recorded a \$82,705,000 non-cash pre-tax impairment charge. The after-tax effect of the charge was \$65,337,000 or \$1.09 per share. The USCG adopted regulations on ballast water management systems (“BWMS”) establishing a standard for the allowable concentration of living organisms in certain vessel ballast water discharged in waters of the United States under the National Invasive Species Act. The regulations include requirements for the installation of engineering equipment to treat ballast water by establishing an approval process for BWMS. The USCG has approved manufacturers’ systems that met the regulatory discharge standard equivalent to the International Maritime Organization’s D-2 standard. The phase-in schedule for those existing vessels requiring a system to install BWMS equipment is dependent on vessel build date, ballast water capacity, and drydock schedule. Compliance with the ballast water treatment regulations requires the installation of equipment on some of the Company’s vessels to treat ballast water before it is discharged. The installation of BWMS equipment will require significant capital expenditures at the next scheduled drydocking to complete the installation of the approved system on those existing vessels that require a system to comply with the BWMS regulations.

Due to the advanced age of four of the Company’s older articulated tank barge and tugboat units (“ATBs”) and the high cost of installation of BWMS, the Company will retire the ATBs at their next scheduled shipyard dates which range between 2020 and 2023 instead of installing the expensive BWMS equipment required to operate the vessels past their next required shipyard dates. A pre-tax impairment charge of \$78,835,000 was incurred in the fourth quarter of 2018 to reduce the ATBs to a fair value of \$13,247,000 due to reduced estimated cash flows resulting from reduced lives on these four older ATBs. The reduced estimated useful lives are due to the assessment of the impact of the new regulations by USCG that require the installation of BWMS. The fair value of the four ATBs of \$13,247,000 is presented in marine transportation equipment at December 31, 2018.

The impairment charge also included a pre-tax charge of \$3,870,000 as the Company reduced the carrying value of its improvements in a leased barge to its scrap value of \$220,000. As part of a lease termination, the Company agreed to terminate the lease, purchase the barge and then scrap the barge which resulted in the Company committing to put the barge up for sale in December 2018. The barge was scrapped in January 2019. The fair market value of the barge was \$220,000 at December 31, 2018, and was presented in prepaid expenses and other current assets. In addition, the Company incurred \$2,403,000 in lease cancellation costs in December 2018 related to the leased barge.

During the fourth quarter of 2017, the Company recorded a \$105,712,000 non-cash pre-tax impairment charge. The after-tax effect of the charge was \$66,975,000 or \$1.20 per share. The impairment charge was to reduce certain vessels to a fair value of \$12,550,000 as the Company decided to put certain older out-of-service vessels up for sale in its marine transportation segment in response to lower equipment utilization, pricing pressure and expensive BWMS installations required in the next few years on some of the coastal tank barges. Retiring some of the older coastal marine vessels reduces the fleet's age profile and improves the efficiency of the fleet. The fair market value of the vessels was \$12,550,000 at December 31, 2017, and was presented in prepaid expenses and other current assets.

(5) Inventories

The following table presents the details of inventories as of December 31, 2018 and 2017 (in thousands):

	December 31, 2018	December 31, 2017
Finished goods	\$ 406,364	\$ 242,333
Work in process	101,077	73,396
	<u>\$ 507,441</u>	<u>\$ 315,729</u>

(6) Fair Value Measurements

The accounting guidance for using fair value to measure certain assets and liabilities establishes a three tier value hierarchy, which prioritizes the inputs to valuation techniques used in measuring fair value. These tiers include: Level 1, defined as observable inputs such as quoted prices in active markets for identical assets or liabilities; Level 2, defined as inputs other than quoted prices in active markets that are either directly or indirectly observable; and Level 3, defined as unobservable inputs in which little, if any, market data exists, therefore requiring an entity to develop its own assumptions about the assumptions that market participants would use in pricing the asset or liability.

Cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities have carrying values that approximate fair value due to the short-term maturity of these financial instruments. The fair value of the Company's debt instruments is described in Note 7, Long-Term Debt.

Certain assets are measured at fair value on a nonrecurring basis. These assets are adjusted to fair value when there is evidence of impairment. During the 2018 fourth quarter, the Company reduced certain vessels to fair value due to its decision in 2018 to retire certain older vessels requiring expensive BWMS equipment at their next scheduled drydock and put a certain older barge up for sale in its marine transportation segment. The fair value of these vessels was \$13,467,000 at December 31, 2018 and \$13,247,000 is presented in marine transportation equipment and \$220,000 is presented in prepaid expenses and other current assets.

(7) Long-Term Debt

Long-term debt at December 31, 2018 and 2017 consisted of the following (in thousands):

	<u>2018</u>	<u>2017</u>
Long-term debt, including current portion:		
\$850,000,000 revolving credit facility due June 26, 2022	\$ 417,373	\$ 495,845
\$150,000,000 senior notes Series A due February 27, 2020	150,000	150,000
\$350,000,000 senior notes Series B due February 27, 2023	350,000	350,000
\$500,000,000 senior notes due March 1, 2028	500,000	—
\$10,000,000 credit line due June 30, 2019	—	—
Bank notes payable	19	3
	<u>1,417,392</u>	<u>995,848</u>
Unamortized debt issuance costs	(6,550)	(3,442)
Unamortized debt discount	(654)	—
	<u>\$ 1,410,188</u>	<u>\$ 992,406</u>

The aggregate payments due on the long-term debt in each of the next five years were as follows (in thousands):

2019	\$ 19
2020	150,000
2021	—
2022	417,373
2023	350,000
Thereafter	500,000
	<u>\$ 1,417,392</u>

On February 12, 2018, the Company issued \$500,000,000 of 4.2% senior unsecured notes due March 1, 2028 (the "2028 Notes") with U.S. Bank National Association, as trustee. Interest payments of \$10,500,000 are due semi-annually on March 1 and September 1 of each year, with the exception of the first payment on September 1, 2018, which was \$11,608,000. The Company received cash proceeds of \$495,019,000, net of the original issue discount of \$705,000 and debt issuance costs of \$4,276,000. The 2028 Notes are unsecured and rank equally in right of payment with the Company's other unsecured senior indebtedness. The 2028 Notes contain certain covenants on the part of the Company, including covenants relating to liens, sale-leasebacks, asset sales and mergers, among others. The 2028 Notes also specify certain events of default, upon the occurrence of which the maturity of the notes may be accelerated, including failure to pay principal and interest, violation of covenants or default on other indebtedness, among others. The Company used the proceeds from the issuance of the 2028 Notes to fund the acquisition of Higman. The remaining net proceeds of the sale of the 2028 Notes were used for the repayment of indebtedness under the Company's bank credit facilities. As of December 31, 2018, the Company was in compliance with all the 2028 Notes covenants and had \$500,000,000 outstanding under the 2028 Notes.

The Company has an \$850,000,000 unsecured revolving credit facility ("Revolving Credit Facility") with a syndicate of banks, with JPMorgan Chase Bank, N.A. as the administrative agent bank, with a maturity date of June 26, 2022. In addition, the credit agreement allows for a \$300,000,000 increase in the aggregate commitments of the banks in the form of revolving credit loans or term loans, subject to the consent of each bank that elects to participate in the increased commitment. The variable interest rate spread varies with the Company's senior debt rating and, effective February 20, 2018, due to a change in one of the Company's credit ratings, the spread over LIBOR increased from 1.00% to 1.125% and the Alternate Base Rate spread is currently 0.125% over the agent bank's prime rate. The commitment fee increased as well from 0.10% to 0.15%. The Revolving Credit Facility contains certain restrictive financial covenants including an interest coverage ratio and a debt-to-capitalization ratio. In addition to financial covenants, the Revolving Credit Facility contains covenants that, subject to exceptions, restrict debt incurrence, mergers and acquisitions, sales of assets, dividends and investments, liquidations and dissolutions, capital leases, transactions with affiliates and changes in lines of business. Borrowings under the Revolving Credit Facility may be used for general corporate purposes, the purchase of existing or new equipment, the purchase of the Company's common stock, or for business acquisitions. As of December 31, 2018, the Company was in compliance with all Revolving Credit Facility covenants and had \$417,373,000 of debt outstanding under the Revolving Credit Facility. The average borrowing under the Revolving Credit Facility during 2018 was \$411,613,000, computed by averaging the daily balance, and the weighted average interest rate was 3.1%, computed by dividing the interest expense under the Revolving Credit Facility by the average Revolving Credit Facility borrowing. The Revolving Credit Facility includes a \$25,000,000 commitment which may be used for standby letters of credit. Outstanding letters of credit under the Revolving Credit Facility were \$6,788,000 as of December 31, 2018.

The Company has \$500,000,000 of unsecured senior notes (“Senior Notes Series A” and “Senior Notes Series B”) with a group of institutional investors, consisting of \$150,000,000 of 2.72% Senior Notes Series A due February 27, 2020 and \$350,000,000 of 3.29% Senior Notes Series B due February 27, 2023. No principal payments are required until maturity. The Senior Notes Series A and Series B contain certain covenants on the part of the Company, including an interest coverage covenant, a debt-to-capitalization covenant and covenants relating to liens, asset sales and mergers, among others. The Senior Notes Series A and Series B also specify certain events of default, upon the occurrence of which the maturity of the notes may be accelerated, including failure to pay principal and interest, violation of covenants or default on other indebtedness, among others. As of December 31, 2018, the Company was in compliance with all Senior Notes Series A and Series B covenants and had \$150,000,000 of Senior Notes Series A outstanding and \$350,000,000 of Senior Notes Series B outstanding.

The Company has a \$10,000,000 line of credit (“Credit Line”) with Bank of America, N.A. (“Bank of America”) for short-term liquidity needs and letters of credit, with a maturity date of June 30, 2019. The Credit Line allows the Company to borrow at an interest rate agreed to by Bank of America and the Company at the time each borrowing is made or continued. The Company had no borrowings outstanding under the Credit Line as of December 31, 2018. Outstanding letters of credit under the Credit Line were \$1,171,000 as of December 31, 2018.

On September 13, 2017, as a result of the S&S acquisition, the Company assumed \$12,135,000 of term debt which was paid off without penalty in the 2017 fourth quarter.

The Company also had \$19,000 of short-term secured loans outstanding, as of December 31, 2018, related to its South American operations.

The estimated fair value of total debt outstanding at December 31, 2018 and 2017 was \$1,411,628,000 and \$984,017,000, respectively, which differs from the carrying amount of \$1,410,188,000 and \$992,406,000, respectively, included in the consolidated financial statements. The fair value was determined using an income approach that relies on inputs such as yield curves.

(8) Taxes on Income

Earnings before taxes on income and details of the provision for taxes on income for the years ended December 31, 2018, 2017 and 2016 were as follows (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Earnings (loss) before taxes on income:			
United States	\$ 117,800	\$ 74,267	\$ 227,746
Foreign	(3,641)	(1,253)	—
	<u>\$ 114,159</u>	<u>\$ 73,014</u>	<u>\$ 227,746</u>
Provision (benefit) for taxes on income:			
U.S. Federal:			
Current	\$ —	\$ 11,143	\$ 28,919
Deferred	27,102	(258,703)	49,685
	<u>\$ 27,102</u>	<u>\$ (247,560)</u>	<u>\$ 78,604</u>
U.S. State:			
Current	\$ (243)	\$ 3,861	\$ 4,727
Deferred	7,619	2,280	1,611
	<u>\$ 7,376</u>	<u>\$ 6,141</u>	<u>\$ 6,338</u>
Foreign:			
Current	\$ 443	\$ 370	\$ —
Deferred	160	160	—
	<u>\$ 603</u>	<u>\$ 530</u>	<u>\$ —</u>
Consolidated:			
Current	\$ 200	\$ 15,374	\$ 33,646
Deferred	34,881	(256,263)	51,296
	<u>\$ 35,081</u>	<u>\$ (240,889)</u>	<u>\$ 84,942</u>

In 2018, the Company filed its 2017 US tax return and completed its analysis of the income tax impacts of the Tax Cuts and Jobs Act which was signed into law on December 22, 2017. There are no material changes to the income tax effects to those previously reported in 2017.

The Company's provision for taxes on income varied from the statutory federal income tax rate for the years ended December 31, 2018, 2017 and 2016 due to the following:

	<u>2018</u>	<u>2017</u>	<u>2016</u>
United States income tax statutory rate	21.0%	35.0%	35.0%
State and local taxes, net of federal benefit	6.5	0.9	1.8
Change due to U.S. tax reform	—	(369.0)	—
Other – net	3.2	3.2	0.5
	<u>30.7%</u>	<u>(329.9)%</u>	<u>37.3%</u>

The tax effects of temporary differences that give rise to significant portions of the non-current deferred tax assets and liabilities at December 31, 2018 and 2017 were as follows (in thousands):

	<u>2018</u>	<u>2017</u>
Non-current deferred tax assets and liabilities:		
Deferred tax assets:		
Allowance for doubtful accounts	\$ 2,105	\$ 1,875
Inventory	5,017	3,795
Insurance accruals	4,119	4,599
Deferred compensation	1,291	1,849
Unrealized loss on defined benefit plans	9,891	11,097
Operating loss carryforwards	81,867	15,540
Pension benefits	6,559	549
Other	22,421	16,301
	<u>133,270</u>	<u>55,605</u>
Valuation allowances	(25,568)	(15,308)
	<u>107,702</u>	<u>40,297</u>
Deferred tax liabilities:		
Property	(526,873)	(428,947)
Deferred state taxes	(74,638)	(58,366)
Goodwill and other intangibles	(34,235)	(9,015)
Other	(14,741)	(12,420)
	<u>(650,487)</u>	<u>(508,748)</u>
	<u>\$ (542,785)</u>	<u>\$ (468,451)</u>

During 2018, the Company generated a net operating loss mainly caused by taking the full cost deduction of purchased fixed assets. The deferred tax assets of \$18,922,000 has been recorded at December 31, 2018 and can be utilized by future taxable income indefinitely. The Company also inherited a \$35,133,000 historical net operating loss of Higman, which was acquired in February 2018 and more fully described in Note 3, Acquisitions. The Higman loss will expire in various amounts through 2037. After conducting loss utilization limit and future gain recognition research, the Company has determined that it is more likely than not that all federal deferred tax assets at December 31, 2018 will be realized.

The Company had state operating loss deferred tax assets of \$19,039,000 in 2018 and \$9,289,000 in 2017. The valuation allowance for state deferred tax assets as of December 31, 2018 and 2017 was \$17,027,000 and \$9,289,000, respectively, related to the Company's state net operating loss carryforwards based on the Company's determination that it is more likely than not that the deferred tax assets will not be realized. Expiration of these state net operating loss carryforwards vary by state through 2037 and none will expire in fiscal 2019.

As of December 31, 2018, the Company had a Canadian net operating loss carryforward of \$8,541,000 which expires in 2038. A full valuation allowance has been provided for this asset.

The Company or one of its subsidiaries files income tax returns in the United States federal jurisdiction and various state jurisdictions. The Company is currently open to audit under the statute of limitations by the Internal Revenue Service for the 2015 through 2017 tax years. With few exceptions, the Company and its subsidiaries' state income tax returns are open to audit under the statute of limitations for the 2012 through 2017 tax years.

As of December 31, 2018, the Company has provided a liability of \$1,909,000 for unrecognized tax benefits related to various income tax issues which includes interest and penalties. The amount that would impact the Company's effective tax rate, if recognized, is \$1,182,000, with the difference between the total amount of unrecognized tax benefits and the amount that would impact the effective tax rate being primarily related to the federal tax benefit of state income tax items. It is not reasonably possible to determine if the liability for unrecognized tax benefits will significantly change prior to December 31, 2019 due to the uncertainty of possible examination results.

A reconciliation of the beginning and ending amount of the liability for unrecognized tax benefits for the years ended December 31, 2018, 2017 and 2016, is as follows (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Balance at beginning of year	\$ 1,787	\$ 2,019	\$ 1,958
Additions based on tax positions related to the current year	254	403	187
Additions for tax positions of prior years	70	273	867
Reductions for tax positions of prior years	(668)	(908)	(441)
Settlements	—	—	(552)
Balance at end of year	<u>\$ 1,443</u>	<u>\$ 1,787</u>	<u>\$ 2,019</u>

The Company accounts for interest and penalties related to uncertain tax positions as part of its provision for federal and state income taxes. The Company recognized net benefit of \$209,000 in interest and penalties for the year ended December 31, 2018 and net expense of \$120,000 and \$88,000 in interest and penalties for the years ended December 31, 2017 and 2016, respectively. The Company had \$466,000, \$675,000 and \$554,000 of accrued liabilities for the payment of interest and penalties at December 31, 2018, 2017 and 2016, respectively.

(9) Leases

The Company and its subsidiaries currently lease various facilities and equipment under a number of cancelable and noncancelable operating leases. Lease agreements for barges have terms from one to 12 years expiring at various dates through 2028. Lease agreements for towing vessels chartered by the Company have terms from 30 days to ten years expiring at various dates through 2027; however, approximately 75% of the towing vessel charter agreements are for terms of one year or less. Total rental expense for the years ended December 31, 2018, 2017 and 2016 was as follows (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Rental expense:			
Marine equipment — barges	\$ 10,234	\$ 11,550	\$ 13,791
Marine equipment — towing vessels	140,389	116,690	137,609
Other buildings and equipment	23,365	15,915	11,182
Rental expense	<u>\$ 173,988</u>	<u>\$ 144,155</u>	<u>\$ 162,582</u>

Future minimum lease payments under operating leases that have initial or remaining noncancelable lease terms in excess of one year at December 31, 2018 were as follows (in thousands):

	<u>Land, Buildings And Equipment</u>	<u>Marine Equipment</u>		<u>Total</u>
		<u>Barges</u>	<u>Towing Vessels</u>	
2019	\$ 19,524	\$ 6,808	\$ 70,759	\$ 97,091
2020	16,916	5,400	7,746	30,062
2021	15,112	4,128	2,578	21,818
2022	13,547	4,138	2,578	20,263
2023	11,821	3,030	2,578	17,429
Thereafter	75,818	7,098	9,023	91,939
	<u>\$ 152,738</u>	<u>\$ 30,602</u>	<u>\$ 95,262</u>	<u>\$ 278,602</u>

(10) Stock Award Plans

The Company has share-based compensation plans which are described below. The compensation cost that has been charged against earnings for the Company's stock award plans and the income tax benefit recognized in the statement of earnings for stock awards for the years ended December 31, 2018, 2017 and 2016 were as follows (in thousands):

	2018	2017	2016
Compensation cost	\$ 19,104	\$ 11,460	\$ 11,675
Income tax benefit	\$ 5,903	\$ 4,333	\$ 4,378

The Company has an employee stock award plan for selected officers and other key employees which provides for the issuance of stock options, restricted stock awards and performance awards. On February 19, 2018, the employee stock award plan was amended to also allow for the granting of RSUs to selected officers and other key employees. The amendment included a provision for the continued vesting of unvested stock options and RSUs for employees who meet certain years of service and age requirements at the time of their retirement. The vesting change resulted in shorter expense accrual periods on stock options and RSUs granted after February 19, 2018 to employees who are nearing retirement and meet the service and age requirements.

The exercise price for each option equals the fair market value per share of the Company's common stock on the date of grant. Substantially all stock options outstanding under the plan have terms of seven years and vest ratably over three years. No performance awards payable in stock have been awarded under the plan. At December 31, 2018, 1,575,948 shares were available for future grants under the employee plan and no outstanding stock options under the employee plan were issued with stock appreciation rights.

The following is a summary of the stock option activity under the employee plan described above for the years ended December 31, 2018, 2017 and 2016:

	Outstanding Non- Qualified or Nonincentive Stock Awards	Weighted Average Exercise Price
Outstanding at December 31, 2015	430,432	\$ 71.01
Granted	186,706	\$ 53.50
Canceled or expired	(16,017)	\$ 80.17
Outstanding at December 31, 2016	601,121	\$ 65.33
Granted	123,141	\$ 68.46
Exercised	(36,616)	\$ 47.95
Canceled or expired	(32,991)	\$ 74.07
Outstanding at December 31, 2017	654,655	\$ 66.45
Granted	115,797	\$ 75.50
Exercised	(283,886)	\$ 61.81
Canceled or expired	(21,864)	\$ 102.42
Outstanding at December 31, 2018	<u>464,702</u>	\$ 69.85

Under the employee plan, stock options exercisable were 230,254, 380,608 and 321,942 at December 31, 2018, 2017 and 2016, respectively.

The following table summarizes information about the Company's outstanding and exercisable stock options under the employee plan at December 31, 2018:

Range of Exercise Prices	Options Outstanding			Options Exercisable			
	Number Outstanding	Weighted Average Contractual Life in Years	Weighted Average Exercise Price	Aggregated Intrinsic Value	Number Exercisable	Weighted Average Exercise Price	Aggregated Intrinsic Value
\$51.23	90,975	4.1	\$ 51.23		57,438	\$ 51.23	
\$64.65 – \$68.50	126,260	4.7	\$ 67.23		41,146	\$ 67.40	
\$70.65 – \$75.50	207,156	4.5	\$ 74.56		91,359	\$ 73.36	
\$93.64 – \$101.46	40,311	2.1	\$ 95.90		40,311	\$ 95.90	
\$51.23 – \$101.46	<u>464,702</u>	4.3	\$ 69.85	\$1,570,000	<u>230,254</u>	\$ 70.72	\$951,000

The following is a summary of the restricted stock award activity under the employee plan described above for the years ended December 31, 2018, 2017 and 2016:

	Unvested Restricted Stock Award Shares	Weighted Average Grant Date Fair Value Per Share
Nonvested balance at December 31, 2015	311,727	\$ 75.73
Granted	190,610	\$ 53.56
Vested	(105,109)	\$ 69.93
Forfeited	(19,573)	\$ 76.06
Nonvested balance at December 31, 2016	377,655	\$ 66.14
Granted	127,255	\$ 68.50
Vested	(105,600)	\$ 68.91
Forfeited	(35,189)	\$ 69.45
Nonvested balance at December 31, 2017	364,121	\$ 65.84
Vested	(144,265)	\$ 72.66
Forfeited	(5,640)	\$ 64.60
Nonvested balance at December 31, 2018	<u>214,216</u>	\$ 64.73

The following is a summary of RSU activity under the employee plan described above for the year ended December 31, 2018:

	Unvested RSUs	Weighted Average Grant Date Fair Value Per Unit
Nonvested balance at December 31, 2017	—	\$ —
Granted	143,890	\$ 75.59
Forfeited	(2,835)	\$ 75.50
Nonvested balance at December 31, 2018	<u>141,055</u>	\$ 75.59

The Company has a stock award plan for nonemployee directors of the Company which provides for the issuance of stock options and restricted stock. The director plan provides for automatic grants of restricted stock to nonemployee directors after each annual meeting of stockholders. In addition, the director plan allows for the issuance of stock options or restricted stock in lieu of cash for all or part of the annual director fee at the option of the director. The exercise prices for all options granted under the plan are equal to the fair market value per share of the Company's common stock on the date of grant. The terms of the options are ten years. The restricted stock issued after each annual meeting of stockholders vests six months after the date of grant. Options granted and restricted stock issued in lieu of cash director fees vest in equal quarterly increments during the year to which they relate. At December 31, 2018, 486,058 shares were available for future grants under the director plan. The director stock award plan is intended as an incentive to attract and retain qualified independent directors.

The following is a summary of the stock option activity under the director plan described above for the years ended December 31, 2018, 2017, and 2016:

	Outstanding Non- Qualified or Nonincentive Stock Awards	Weighted Average Exercise Price
Outstanding at December 31, 2015	220,429	\$ 64.37
Exercised	(9,000)	\$ 35.72
Canceled or expired	(6,000)	\$ 99.52
Outstanding at December 31, 2016	205,429	\$ 64.60
Granted	3,188	\$ 70.65
Exercised	(39,000)	\$ 46.23
Canceled or expired	(12,000)	\$ 87.35
Outstanding at December 31, 2017	157,617	\$ 67.54
Granted	2,640	\$ 85.30
Exercised	(29,153)	\$ 57.47
Outstanding at December 31, 2018	131,104	\$ 70.14

Under the director plan, options exercisable were 130,444, 156,820 and 205,429 at December 31, 2018, 2017 and 2016, respectively.

The following table summarizes information about the Company's outstanding and exercisable stock options under the director plan at December 31, 2018:

Range of Exercise Prices	Options Outstanding				Options Exercisable		
	Number Outstanding	Weighted Average Remaining Contractual Life in Years	Weighted Average Exercise Price	Aggregate Intrinsic Value	Number Exercisable	Weighted Average Exercise Price	Aggregate Intrinsic Value
\$29.60	6,000	0.3	\$ 29.60		6,000	\$ 29.60	
\$41.24 – \$56.45	31,276	1.9	\$ 50.61		31,276	\$ 50.61	
\$61.89 – \$62.48	28,000	3.6	\$ 62.27		28,000	\$ 62.27	
\$70.65 – \$99.52	65,828	5.2	\$ 86.45		65,168	\$ 86.47	
\$29.60 – \$99.52	131,104	3.8	\$ 70.14	\$893,000	130,444	\$ 70.06	\$893,000

The following is a summary of the restricted stock award activity under the director plan described above for the years ended December 31, 2018, 2017 and 2016:

	Unvested Restricted Stock Award Shares	Weighted Average Grant Date Fair Value Per Share
Nonvested balance at December 31, 2015	1,791	\$ 68.73
Granted	23,074	\$ 64.89
Vested	(24,518)	\$ 65.17
Nonvested balance at December 31, 2016	347	\$ 64.89
Granted	21,198	\$ 70.65
Vested	(21,226)	\$ 70.56
Nonvested balance at December 31, 2017	319	\$ 70.65
Granted	21,373	\$ 85.70
Vested	(21,428)	\$ 85.48
Nonvested balance at December 31, 2018	264	\$ 85.30

The total intrinsic value of all stock options exercised under all of the Company's plans was \$6,709,000, \$1,671,000 and \$266,000 for the years ended December 31, 2018, 2017 and 2016, respectively. The actual tax benefit realized for tax deductions from stock option exercises was \$2,073,000, \$632,000 and \$100,000 for the years ended December 31, 2018, 2017 and 2016, respectively.

The total intrinsic value of all the restricted stock vestings under all of the Company's plans was \$12,936,000, \$8,485,000 and \$6,928,000 for the years ended December 31, 2018, 2017 and 2016, respectively. The actual tax benefit realized for tax deductions from restricted stock vestings was \$3,997,000, \$3,208,000 and \$2,598,000 for the years ended December 31, 2018, 2017 and 2016, respectively.

There were no RSU vestings for the year ended December 31, 2018.

As of December 31, 2018, there was \$2,294,000 of unrecognized compensation cost related to nonvested stock options, \$8,647,000 related to restricted stock and \$5,732,000 related to nonvested RSUs. The stock options are expected to be recognized over a weighted average period of approximately 1.5 years, restricted stock over approximately 2.2 years and RSUs over approximately 3.9 years. The total fair value of stock options vested was \$3,191,000, \$2,530,000 and \$2,495,000 during the years ended December 31, 2018, 2017 and 2016, respectively. The fair value of the restricted stock vested was \$12,936,000, \$8,485,000 and \$6,928,000 for the years ended December 31, 2018, 2017 and 2016, respectively.

The weighted average per share fair value of stock options granted during the years ended December 31, 2018, 2017 and 2016 was \$23.53, \$20.72 and \$17.30, respectively. The fair value of the stock options granted during the years ended December 31, 2018, 2017 and 2016 was \$2,787,000, \$2,617,000 and \$3,231,000, respectively. The Company currently uses treasury stock shares for restricted stock grants and stock option exercises. The fair value of each stock option was determined using the Black-Scholes option pricing model. The key input variables used in valuing the stock options during the years ended December 31, 2018, 2017 and 2016 were as follows:

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Dividend yield	None	None	None
Average risk-free interest rate	2.7%	2.0%	1.5%
Stock price volatility	27%	27%	30%
Estimated option term	Six years	Six years	Six years

(11) Retirement Plans

The Company sponsors a defined benefit plan for its inland vessel personnel and shore based tankermen. The plan benefits are based on an employee's years of service and compensation. The plan assets consist primarily of equity and fixed income securities.

On April 12, 2017, the Company amended its pension plan to cease all benefit accruals for periods after May 31, 2017 for certain participants. Participants grandfathered and not impacted were those, as of the close of business on May 31, 2017, who either (a) had completed 15 years of pension service or (b) had attained age 50 and completed 10 years of pension service. Participants non-grandfathered are eligible to receive discretionary 401(k) plan contributions. The Company did not incur any one-time charges related to this amendment but the pension plan's projected benefit obligation decreased by \$33,433,000.

On February 14, 2018, with the acquisition of Higman, the Company assumed Higman's pension plan for its inland vessel personnel and office staff. On March 27, 2018, the Company amended the Higman pension plan to close it to all new entrants and cease all benefit accruals for periods after May 15, 2018 for all participants. The Company did not incur any one-time charges related to this amendment but the Higman pension plan's projected benefit obligation decreased by \$3,081,000. The Company made a pension contribution to the Higman plan of \$6,717,000 in March 2018 to complete all required funding for the 2016 and 2017 years and make its 2018 first quarter contribution. The Company made an additional contribution to the Higman pension plan of \$1,385,000 in the fourth quarter of 2018 for the 2018 year.

The fair value of plan assets of the Company’s pension plans was \$303,151,000 and \$294,995,000 at December 31, 2018 and 2017 respectively. As of December 31, 2018 and 2017, these assets were allocated among asset categories as follows:

Asset Category	2018	2017	Current Minimum, Target and Maximum Allocation Policy
U.S. equity securities	52%	51%	30% — 50% — 70%
International equity securities	17%	21%	0% — 20% — 30%
Debt securities	28%	28%	15% — 30% — 55%
Cash and cash equivalents	3%	—%	0% — 0% — 5%
	<u>100%</u>	<u>100%</u>	

The plan assets are invested entirely in common collective trusts. These instruments are public investment vehicles valued using the net asset value provided by the administrator of the fund. The net asset value is classified within Level 2 of the valuation hierarchy as set forth in the accounting guidance for fair value measurements because the net asset value price is quoted on an inactive private market although the underlying investments are traded on an active market.

The Company’s investment strategy focuses on total return on invested assets (capital appreciation plus dividend and interest income). The primary objective in the investment management of assets is to achieve long-term growth of principal while avoiding excessive risk. Risk is managed through diversification of investments within and among asset classes, as well as by choosing securities that have an established trading and underlying operating history.

The Company makes various assumptions when determining defined benefit plan costs including, but not limited to, the current discount rate and the expected long-term return on plan assets. Discount rates are determined annually and are based on a yield curve that consists of a hypothetical portfolio of high quality corporate bonds with maturities matching the projected benefit cash flows. The Company assumed that plan assets would generate a long-term rate of return of 7.0% in 2018 and 2017. The Company developed its expected long-term rate of return assumption by evaluating input from investment consultants comparing historical returns for various asset classes with its actual and targeted plan investments. The Company believes that its long-term asset allocation, on average, will approximate the targeted allocation.

The Company’s pension plan funding strategy is to make annual contributions in amounts equal to or greater than amounts necessary to meet minimum government funding requirements. The plan’s benefit obligations are based on a variety of demographic and economic assumptions, and the pension plan assets’ returns are subject to various risks, including market and interest rate risk, making an accurate prediction of the pension plan contribution difficult. The Company’s pension plan funding was 85% of the pension plans’ ABO at December 31, 2018, including the Higman pension plan.

The Company sponsors an unfunded defined benefit health care plan that provides limited postretirement medical benefits to employees who met minimum age and service requirements, and to eligible dependents. The plan limits cost increases in the Company’s contribution to 4% per year. The plan is contributory, with retiree contributions adjusted annually. The plan eliminated coverage for future retirees as of December 31, 2011. The Company also has an unfunded defined benefit supplemental executive retirement plan (“SERP”) that was assumed in an acquisition in 1999. That plan ceased to accrue additional benefits effective January 1, 2000.

The following table presents the change in benefit obligation and plan assets for the Company's defined benefit plans and postretirement benefit plan (in thousands):

	Pension Benefits				Other Postretirement Benefits	
	Pension Plan		SERP		Postretirement Welfare Plan	
	2018	2017	2018	2017	2018	2017
Change in benefit obligation						
Benefit obligation at beginning of year	\$ 354,994	\$ 337,176	\$ 1,412	\$ 1,457	\$ 679	\$ 675
Service cost	7,622	10,677	—	—	—	—
Interest cost	15,499	13,729	49	58	24	27
Actuarial loss (gain)	(44,935)	34,563	(70)	42	143	52
Gross benefits paid	(11,749)	(7,718)	(145)	(145)	(103)	(75)
Curtailments	(3,081)	(33,433)	—	—	—	—
Acquisition	63,133	—	—	—	—	—
Benefit obligation at end of year	<u>\$ 381,483</u>	<u>\$ 354,994</u>	<u>\$ 1,246</u>	<u>\$ 1,412</u>	<u>\$ 743</u>	<u>\$ 679</u>
Accumulated benefit obligation at end of year						
	<u>\$ 356,797</u>	<u>\$ 324,904</u>	<u>\$ 1,246</u>	<u>\$ 1,412</u>	<u>\$ 743</u>	<u>\$ 679</u>
Weighted-average assumption used to determine benefit obligation at end of year						
Discount rate (a)	4.4%	3.7%	4.4%	3.7%	4.4%	3.7%
Rate of compensation increase	Service-based table	Service-based table	—	—	—	—
Health care cost trend rate						
Initial rate	—	—	—	—	7.0%	7.0%
Ultimate rate	—	—	—	—	5.0%	5.0%
Years to ultimate	—	—	—	—	2025	2022
Effect of one-percentage-point change in assumed health care cost trend rate on postretirement obligation						
Increase	\$ —	\$ —	\$ —	\$ —	\$ 75	\$ 75
Decrease	—	—	—	—	(65)	(65)
Change in plan assets						
Fair value of plan assets at beginning of year	\$ 294,995	\$ 257,517	\$ —	\$ —	\$ —	\$ —
Actual return on plan assets	(18,214)	45,196	—	—	—	—
Employer contribution	8,102	—	145	145	103	75
Gross benefits paid	(11,749)	(7,718)	(145)	(145)	(103)	(75)
Acquisition	30,017	—	—	—	—	—
Fair value of plan assets at end of year	<u>\$ 303,151</u>	<u>\$ 294,995</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>

(a) The discount rate for the Higman pension plan in 2018 was changed from 4.13% as of February 14, 2018 and 4.02% as of March 31, 2018 to 4.40% as of December 31, 2018.

The following table presents the funded status and amounts recognized in the Company's consolidated balance sheet for the Company's defined benefit plans and postretirement benefit plan at December 31, 2018 and 2017 (in thousands):

	Pension Benefits				Other Postretirement Benefits	
	Pension Plan		SERP		Postretirement Welfare Plan	
	2018	2017	2018	2017	2018	2017
Funded status at end of year						
Fair value of plan assets	\$ 303,151	\$ 294,995	\$ —	\$ —	\$ —	\$ —
Benefit obligations	(381,483)	(354,994)	(1,246)	(1,412)	(743)	(679)
Funded status and amount recognized at end of year	<u>\$ (78,332)</u>	<u>\$ (59,999)</u>	<u>\$ (1,246)</u>	<u>\$ (1,412)</u>	<u>\$ (743)</u>	<u>\$ (679)</u>
Amounts recognized in the consolidated balance sheets						
Noncurrent asset	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
Current liability	—	—	(158)	(159)	(65)	(54)
Long-term liability	(78,332)	(59,999)	(1,087)	(1,253)	(678)	(625)
Amounts recognized in accumulated other comprehensive income						
Net actuarial loss (gain)	\$ 47,101	\$ 57,387	\$ 415	\$ 508	\$ (4,313)	\$ (5,053)
Prior service cost (credit)	—	—	—	—	—	—
Accumulated other compensation income	<u>\$ 47,101</u>	<u>\$ 57,387</u>	<u>\$ 415</u>	<u>\$ 508</u>	<u>\$ (4,313)</u>	<u>\$ (5,053)</u>

The projected benefit obligation and fair value of plan assets for pension plans with a projected benefit obligation in excess of plan assets at December 31, 2018 and 2017 were as follows (in thousands):

	Pension Benefits			
	Pension Plan		SERP	
	2018	2017	2018	2017
Projected benefit obligation in excess of plan assets				
Projected benefit obligation at end of year	\$ 381,483	\$ 354,994	\$ 1,246	\$ 1,412
Fair value of plan assets at end of year	303,151	294,995	—	—

The projected benefit obligation, accumulated benefit obligation and fair value of plan assets for pension plans with an accumulated benefit obligation in excess of plan assets at December 31, 2018 and 2017 were as follows (in thousands):

	Pension Benefits			
	Pension Plan		SERP	
	2018	2017	2018	2017
Accumulated benefit obligation in excess of plan assets				
Projected benefit obligation at end of year	\$ 381,483	\$ 354,994	\$ 1,246	\$ 1,412
Accumulated benefit obligation at end of year	356,797	324,904	1,246	1,412
Fair value of plan assets at end of year	303,151	294,995	—	—

The following tables presents the expected cash flows for the Company's defined benefit plans and postretirement benefit plan at December 31, 2018 and 2017 (in thousands):

	Pension Benefits				Other Postretirement Benefits	
	Pension Plan		SERP		Postretirement Welfare Plan	
	2018	2017	2018	2017	2018	2017
Expected employer contributions						
First year	\$ 2,395	\$ —	\$ 162	\$ 162	\$ 66	\$ 48

	Pension Benefits				Other Postretirement Benefits	
	Pension Plan		SERP		Postretirement Welfare Plan	
	2018	2017	2018	2017	2018	2017
Expected benefit payments (gross)						
Year one	\$ 12,209	\$ 9,483	\$ 162	\$ 162	\$ 66	\$ 55
Year two	13,108	10,131	159	159	68	56
Year three	13,959	10,818	155	156	69	58
Year four	14,959	11,608	130	152	57	58
Year five	16,052	12,377	104	149	56	46
Next five years	96,547	75,717	447	462	261	214

	Pension Benefits				Other Postretirement Benefits	
	Pension Plan		SERP		Postretirement Welfare Plan	
	2018	2017	2018	2017	2018	2017
Expected federal subsidy						
Year one	\$ —	\$ —	\$ —	\$ —	\$ —	\$ (7)
Year two	—	—	—	—	—	(6)
Year three	—	—	—	—	—	(6)
Year four	—	—	—	—	—	(6)
Year five	—	—	—	—	—	(7)
Next five years	—	—	—	—	—	(30)

The components of net periodic benefit cost and other changes in plan assets and benefit obligations recognized in other comprehensive income for the Company's defined benefit plans for the years ended December 31, 2018, 2017 and 2016 were as follows (in thousands):

	Pension Benefits					
	Pension Plan			SERP		
	2018	2017	2016	2018	2017	2016
Components of net periodic benefit cost						
Service cost	\$ 7,622	\$ 10,677	\$ 13,402	\$ —	\$ —	\$ —
Interest cost	15,499	13,729	14,123	49	58	65
Expected return on plan assets	(22,406)	(18,195)	(16,805)	—	—	—
Amortization:						
Actuarial loss	2,890	4,400	5,484	23	28	26
Prior service credit	—	—	—	—	—	—
Net periodic benefit cost	<u>3,605</u>	<u>10,611</u>	<u>16,204</u>	<u>72</u>	<u>86</u>	<u>91</u>
Other changes in plan assets and benefit obligations recognized in other comprehensive income						
Current year actuarial loss (gain)	(7,396)	7,562	15,203	(70)	42	12
Recognition of actuarial loss	(2,890)	(37,833)	(5,484)	(23)	(28)	(26)
Recognition of prior service credit	—	—	—	—	—	—
Total recognized in other comprehensive income	<u>(10,286)</u>	<u>(30,271)</u>	<u>9,719</u>	<u>(93)</u>	<u>14</u>	<u>(14)</u>
Total recognized in net periodic benefit cost and other comprehensive income	<u>\$ (6,681)</u>	<u>\$ (19,660)</u>	<u>\$ 25,923</u>	<u>\$ (21)</u>	<u>\$ 100</u>	<u>\$ 77</u>
Weighted average assumptions used to determine net periodic benefit cost						
Discount rate (a)	3.7%	4.2/4.0%	4.5%	3.7%	4.2%	4.5%
Expected long-term rate of return on plan assets	7.0%	7.0%	7.0%	—	—	—
Rate of compensation increase	Service- based table	Service- based table	Service- based table	—	—	—

(a) The 2018 discount rate for benefit cost for the Higman pension plan was changed from 4.13% as of February 14, 2018 and 4.02% as of March 31, 2018 to 4.40% as of December 31, 2018. In 2017, benefit cost for the pension plan was determined using a discount rate of 4.2% for the period beginning January 1, 2017 and ending April 11, 2017 and 4.0% for the period beginning April 12, 2017 and ending December 31, 2017.

The estimated amounts that will be amortized from accumulated other comprehensive income into net periodic benefit cost in 2019 are as follows (in thousands):

	Pension Benefits	
	Pension Plan	SERP
Actuarial loss	\$ 2,713	\$ 28
Prior service credit	—	—
	<u>\$ 2,713</u>	<u>\$ 28</u>

The components of net periodic benefit cost and other changes in benefit obligations recognized in other comprehensive income for the Company's postretirement benefit plan for the years ended December 31, 2018, 2017 and 2016 were as follows (in thousands):

	Other Postretirement Benefits		
	Postretirement Welfare Plan		
	2018	2017	2016
Components of net periodic benefit cost			
Service cost	\$ —	\$ —	\$ —
Interest cost	24	27	29
Amortization:			
Actuarial gain	(596)	(668)	(747)
Prior service cost	—	—	—
Net periodic benefit cost	<u>(572)</u>	<u>(641)</u>	<u>(718)</u>
Other changes in benefit obligations recognized in other comprehensive income			
Current year actuarial loss (gain)	144	52	(198)
Recognition of actuarial gain	596	668	747
Recognition of prior service cost	—	—	—
Adjustment for actual Medicare Part D reimbursement	—	—	(3)
Total recognized in other comprehensive income	<u>740</u>	<u>720</u>	<u>546</u>
Total recognized in net periodic benefit cost and other comprehensive income	<u>\$ 168</u>	<u>\$ 79</u>	<u>\$ (172)</u>
Weighted average assumptions used to determine net periodic benefit cost			
Discount rate	3.7%	4.2%	4.5%
Health care cost trend rate:			
Initial rate	7.0%	7.0%	6.5%
Ultimate rate	5.0%	5.0%	5.0%
Years to ultimate	2022	2021	2019
Effect of one-percentage-point change in assumed health care cost trend rate on aggregate service and interest cost			
Increase	\$ 3	\$ 3	\$ 4
Decrease	(2)	(3)	(3)

The estimated amounts that will be amortized from accumulated other comprehensive income into net periodic benefit cost in 2019 are as follows (in thousands):

	Other Postretirement Benefits Postretirement Welfare Plan
Actuarial gain	\$ (540)
Prior service cost	—
	<u>\$ (540)</u>

The Company also contributes to a multiemployer pension plan pursuant to a collective bargaining agreement which covers certain vessel crew members of its coastal operations and expires on April 30, 2019. The Company began participation in the Seafarers Pension Trust ("SPT") with the Penn Maritime, Inc. acquisition on December 14, 2012.

Contributions to the SPT are made currently based on a per day worked basis and charged to expense as incurred and included in costs of sales and operating expenses in the consolidated statement of earnings. During 2018 and 2017, the Company made contributions of \$671,000 and \$896,000, respectively, to the SPT. The Company's contributions to the SPT did not exceed 5% of total contributions to the SPT in 2017. Total contributions for 2018 are not yet available. The Company did not pay any material surcharges in 2017 or 2018.

The federal identification number of the SPT is 13-6100329 and the Certified Zone Status is Green at December 31, 2017. The Company's future minimum contribution requirements under the SPT are unavailable because actuarial reports for the 2018 plan year are not yet complete and such contributions are subject to negotiations between the employers and the unions. The SPT was not in endangered or critical status for the 2017 plan year, the latest period for which a report is available, as the funded status was in excess of 100%. Based on an actuarial valuation performed as of December 31, 2017, there would be no withdrawal liability if the Company chose to withdraw from the SPT although the Company currently has no intention of terminating its participation in the SPT.

The Company also contributes to a multiemployer pension plan pursuant to a collective bargaining agreement which covers certain employees of its distribution and services segment in New Jersey and expires on October 8, 2023. The Company began participation in the Central Pension Fund of the International Union of Operating Engineers and Participating Employers ("CPF") with the S&S acquisition on September 13, 2017.

Contributions to the CPF are made currently based on a fixed hourly rate for each hour worked or paid basis (in some cases contributions are made as a percentage of gross pay) and charged to expense as incurred and included in costs of sales and operating expenses in the consolidated statement of earnings. During 2018 and 2017, the Company made contributions of \$736,000 and \$238,000, respectively, to the CPF. Total contributions for the 2018 plan year are not yet available. The Company did not pay any material surcharges in 2017 or 2018.

The federal identification number of the CPF is 36-6052390 and the Certified Zone Status is Green at January 31, 2018. The Company's future minimum contribution requirements under the CPF are unavailable because actuarial reports for the 2018 plan year, which ended January 31, 2019, are not yet complete and such contributions are subject to negotiations between the employers and the unions. The CPF was not in endangered or critical status for the 2017 plan year, the latest period for which a report is available, as the funded status was 94%. Based on an actuarial valuation performed as of January 31, 2017, there would be no withdrawal liability if the Company chose to withdraw from the CPF although the Company currently has no intention of terminating its participation in the CPF.

In addition to the defined benefit plans, the Company sponsors various defined contribution plans for substantially all employees. The aggregate contributions to the plans were \$22,392,000, \$17,247,000 and \$18,213,000 in 2018, 2017 and 2016, respectively.

(12) Other Comprehensive Income

The Company's changes in other comprehensive income for the years ended December 31, 2018, 2017 and 2016 were as follows (in thousands):

	2018			2017			2016		
	Gross Amount	Income Tax (Provision) Benefit	Net Amount	Gross Amount	Income Tax (Provision) Benefit	Net Amount	Gross Amount	Income Tax (Provision) Benefit	Net Amount
Pension and postretirement benefits (a):									
Amortization of net actuarial loss	\$ 2,317	\$ (585)	\$ 1,732	\$ 3,760	\$ (1,417)	\$ 2,343	\$ 4,763	\$ (1,825)	\$ 2,938
Actuarial gains (losses)	7,322	(1,416)	5,906	25,776	(9,371)	16,405	(15,013)	5,754	(9,259)
Adoption of ASU 2018-02 — reclassification to retained earnings	—	(7,925)	(7,925)	—	—	—	—	—	—
Foreign currency translation adjustments	(819)	—	(819)	(146)	—	(146)	—	—	—
Total	<u>\$ 8,820</u>	<u>\$ (9,926)</u>	<u>\$ (1,106)</u>	<u>\$ 29,390</u>	<u>\$ (10,788)</u>	<u>\$ 18,602</u>	<u>\$ (10,250)</u>	<u>\$ 3,929</u>	<u>\$ (6,321)</u>

(a) Actuarial gains (losses) are amortized into other income (expense). (See Note 11 – Retirement Plans)

(13) Earnings Per Share

The following table presents the components of basic and diluted earnings per share for the years ended December 31, 2018, 2017 and 2016 (in thousands, except per share amounts):

	2018	2017	2016
Net earnings attributable to Kirby	\$ 78,452	\$ 313,187	\$ 141,406
Undistributed earnings allocated to restricted shares	(324)	(2,213)	(999)
Income available to Kirby common stockholders — basic	78,128	310,974	140,407
Undistributed earnings allocated to restricted shares	324	2,213	999
Undistributed earnings reallocated to restricted shares	(323)	(2,211)	(997)
Income available to Kirby common stockholders — diluted	<u>\$ 78,129</u>	<u>\$ 310,976</u>	<u>\$ 140,409</u>
Shares outstanding:			
Weighted average common stock issued and outstanding	59,804	55,702	53,834
Weighted average unvested restricted stock	(247)	(394)	(380)
Weighted average common stock outstanding — basic	59,557	55,308	53,454
Dilutive effect of stock options and restricted stock units	132	53	58
Weighted average common stock outstanding — diluted	<u>59,689</u>	<u>55,361</u>	<u>53,512</u>
Net earnings per share attributable to Kirby common stockholders:			
Basic	<u>\$ 1.31</u>	<u>\$ 5.62</u>	<u>\$ 2.63</u>
Diluted	<u>\$ 1.31</u>	<u>\$ 5.62</u>	<u>\$ 2.62</u>

Certain outstanding options to purchase approximately 384,000, 472,000 and 240,000 shares of common stock were excluded in the computation of diluted earnings per share as of December 31, 2018, 2017 and 2016, respectively, as such stock options would have been antidilutive.

(14) Quarterly Results (Unaudited)

The unaudited quarterly results for the year ended December 31, 2018 were as follows (in thousands, except per share amounts):

	Three Months Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Revenues	\$ 741,688	\$ 802,671	\$ 704,845	\$ 721,493
Costs and expenses	692,866	747,260	636,906	740,344
Gain (loss) on disposition of assets	1,898	442	18	(390)
Operating income (loss)	50,720	55,853	67,957	(19,241)
Other income	1,591	1,541	1,454	1,140
Interest expense	(9,780)	(12,540)	(12,345)	(12,191)
Earnings (loss) before taxes on income	42,531	44,854	57,066	(30,292)
Benefit (provision) for taxes on income	(9,865)	(16,061)	(15,116)	5,961
Net earnings (loss)	32,666	28,793	41,950	(24,331)
Less: Net earnings attributable to noncontrolling interests	(195)	(191)	(134)	(106)
Net earnings (loss) attributable to Kirby	<u>\$ 32,471</u>	<u>\$ 28,602</u>	<u>\$ 41,816</u>	<u>\$ (24,437)</u>
Net earnings (loss) per share attributable to Kirby common stockholders:				
Basic	<u>\$ 0.54</u>	<u>\$ 0.48</u>	<u>\$ 0.70</u>	<u>\$ (0.41)</u>
Diluted	<u>\$ 0.54</u>	<u>\$ 0.48</u>	<u>\$ 0.70</u>	<u>\$ (0.41)</u>

The unaudited quarterly results for the year ended December 31, 2017 were as follows (in thousands, except per share amounts):

	Three Months Ended			
	March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017
Revenues	\$ 491,705	\$ 473,328	\$ 541,274	\$ 708,111
Costs and expenses	445,760	425,937	488,186	756,423
Gain (loss) on disposition of assets	99	(139)	(159)	(4,288)
Operating income (loss)	46,044	47,252	52,929	(52,600)
Other income (expense)	(589)	228	320	902
Interest expense	(4,457)	(4,465)	(5,388)	(7,162)
Earnings (loss) before taxes on income	40,998	43,015	47,861	(58,860)
Benefit (provision) for taxes on income	(13,353)	(17,043)	(19,072)	290,357
Net earnings	27,645	25,972	28,789	231,497
Less: Net earnings attributable to noncontrolling interests	(162)	(194)	(182)	(178)
Net earnings attributable to Kirby	<u>\$ 27,483</u>	<u>\$ 25,778</u>	<u>\$ 28,607</u>	<u>\$ 231,319</u>
Net earnings per share attributable to Kirby common stockholders:				
Basic	<u>\$ 0.51</u>	<u>\$ 0.48</u>	<u>\$ 0.52</u>	<u>\$ 3.88</u>
Diluted	<u>\$ 0.51</u>	<u>\$ 0.48</u>	<u>\$ 0.52</u>	<u>\$ 3.87</u>

Quarterly basic and diluted earnings per share may not total to the full year per share amounts, as the weighted average number of shares outstanding for each quarter fluctuates as a result of the assumed exercise of stock options.

(15) Contingencies and Commitments

In 2009, the Company was named a Potentially Responsible Party (“PRP”) in addition to a group of approximately 250 named PRPs under the Comprehensive Environmental Response, Compensation and Liability Act of 1981 (“CERCLA”) with respect to a Superfund site, the Portland Harbor Superfund site (“Portland Harbor”) in Portland, Oregon. The site was declared a Superfund site in December 2000 as a result of historical heavily industrialized use due to manufacturing, shipbuilding, petroleum storage and distribution, metals salvaging, and electrical power generation activities which led to contamination of Portland Harbor, an urban and industrial reach of the lower Willamette River located immediately downstream of downtown Portland. The Company’s involvement arises from four spills at the site after it was declared a Superfund site, as a result of predecessor entities’ actions in the area. To date, there is no information suggesting the extent of the costs or damages to be claimed from the 250 notified PRPs. Based on the nature of the involvement at the Portland Harbor site, the Company believes its potential contribution is de minimis; however, to date neither the Environmental Protection Agency (“EPA”) nor the named PRPs have performed an allocation of potential liability in connection with the site nor have they provided costs and expenses in connection with the site.

In January 2015, the Company was named as a defendant in a Complaint filed in the U.S. District Court of the Southern District of Texas, *USOR Site PRP Group vs. A&M Contractors, USES, Inc. et al.* This is a civil action pursuant to the provisions of CERCLA and the Texas Solid Waste Disposal Act for recovery of past and future response costs incurred and to be incurred by the USOR Site PRP Group for response activities at the U.S. Oil Recovery Superfund Site. The property was a former sewage treatment plant owned by defendant City of Pasadena, Texas from approximately 1945 until it was acquired by U.S. Oil Recovery in January 2009. Throughout its operating life, the U.S. Oil Recovery facility portion of the USOR Site received and performed wastewater pretreatment of municipal and Industrial Class I and Class II wastewater, characteristically hazardous waste, used oil and oily sludges, and municipal solid waste. Associated operations were conducted at the MCC Recycling facility portion of the USOR Site after it was acquired by U.S. Oil Recovery from the City of Pasadena in January 2009. The EPA and the PRP Group entered into an Administrative Settlement Agreement and Order for Remedial Investigation Study (“Study”) in May 2015. The Study has not been completed by EPA to date. The Company filed responsive pleadings in this matter. Based on the nature of the involvement at the USOR Site, the Company believes its potential contribution is de minimis; however, the Study and further review of the Company’s activities at the Site remains ongoing.

On October 13, 2016, the Company, as a successor to Hollywood Marine, Inc. (“Hollywood Marine”), was issued a General Notice under CERCLA in which it was named as a PRP for liabilities associated with the SBA Shipyard Site located near Jennings, Louisiana (“Site”). The Site was added to the EPA’s National Priorities List of sites under CERCLA in September 2016. SBA used the facility for construction, repair, retrofitting, sandblasting, and cleaning and painting of barges beginning in 1965. Three barge slips and a dry dock are located off the Mermentau River. The slips were used to dock barges during cleaning or repair. In 2001, a group of PRPs that had been former customers of the SBA Shipyard facility formed an organization called the SSIC Remediation, LLC (hereinafter, “the PRP Group Companies”) to address removal actions at the Site. In 2002, EPA approved an Interim Measures/Removal Action of Hazardous/Principal Threat Wastes at SBA Shipyards, Inc. (pursuant to RCRA Section 3008(h)) that was proposed by SBA Shipyard and the PRP Group Companies. Interim removal activities were conducted from March 2001 through January 2005 under an EPA 2002 Order and Agreement. In September 2012, the Louisiana Department of Environmental Quality requested EPA address the Site under CERCLA authority. The Company, as a successor to Hollywood Marine, joined the PRP Group Companies. The PRP Group Companies have submitted a draft Study work plan to EPA for their review and comment. Higman was named as a PRP in connection with its activities at the Site. Higman is not a participant in the PRP Group Companies.

With respect to the above sites, the Company has recorded reserves, if applicable, for its estimated potential liability for its portion of the EPA’s past costs claim based on information developed to date including various factors such as the Company’s liability in proportion to other responsible parties and the extent to which such costs are recoverable from third parties.

On October 13, 2016, the tug Nathan E. Stewart and barge DBL 55, an ATB, ran aground at the entrance to Seaforth Channel on Atholone Island, British Columbia. The grounding resulted in a breach of a portion of the Nathan E. Stewart's fuel tanks causing a discharge of diesel fuel into the water. The USCG and the National Transportation Safety Board designated the Company as a party of interest in their investigation as to the cause of the incident. The Canadian authorities including Transport Canada and the Canadian Transportation Safety Board investigated the cause of the incident. On October 10, 2018, the Heiltsuk First Nation filed a civil action against a subsidiary of the Company, the master and pilot of the tug, the vessels and the Canadian government seeking unquantified damages as a result of the incident. On the same date, the Canadian government filed charges against the subsidiary and the vessels for violations of the Canadian Fisheries Act, the Migratory Birds Convention Act, the Pilotage Act and the Shipping Act of 2001. To date, there has been no activity in either pending case as deadlines to respond have been extended. The Company is unable to estimate the potential exposure in either proceeding. The Company has various insurance policies covering liabilities including pollution, property, marine and general liability and believes that it has satisfactory insurance coverage for the cost of cleanup and salvage operations as well as other potential liabilities arising from the incident. The Company believes it has accrued adequate reserves for the incident and does not expect the incident to have a material adverse effect on its business or financial condition.

On March 22, 2014, two tank barges and a towboat (the M/V Miss Susan), owned by Kirby Inland Marine, LP, a wholly owned subsidiary of the Company, were involved in a collision with the M/S Summer Wind on the Houston Ship Channel near Texas City, Texas. The lead tank barge was damaged in the collision resulting in a discharge of intermediate fuel oil from one of its cargo tanks. The Company is participating in the natural resource damage assessment and restoration process with federal and state government natural resource trustees. The Company believes it has adequate insurance coverage for pollution, marine and other potential liabilities arising from the incident. The Company believes it has accrued adequate reserves for the incident and does not expect the incident to have a material adverse effect on its business or financial condition.

In addition, the Company is involved in various legal and other proceedings which are incidental to the conduct of its business, none of which in the opinion of management will have a material effect on the Company's financial condition, results of operations or cash flows. Management believes that it has recorded adequate reserves and believes that it has adequate insurance coverage or has meritorious defenses for these other claims and contingencies.

Certain Significant Risks and Uncertainties. The preparation of financial statements in conformity with United States generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates. However, in the opinion of management, the amounts would be immaterial.

The customer base of the marine transportation segment includes major industrial petrochemical and chemical manufacturers, refining companies and agricultural chemical manufacturers operating in the United States. During 2018, approximately 65% of marine transportation's inland revenues were from movements of such products under term contracts, typically ranging from one year to three years, some with renewal options. During 2018, approximately 80% of the marine transportation's coastal revenues were under term contracts. While the manufacturing and refining companies have generally been customers of the Company for numerous years (some as long as 40 years) and management anticipates a continuing relationship, there is no assurance that any individual contract will be renewed. No single customer of the marine transportation segment accounted for 10% or more of the Company's revenues in 2018, 2017 and 2016.

Major customers of the distribution and services segment include oilfield service companies, oil and gas operators and producers, inland and offshore barge operators, offshore fishing companies, on-highway transportation companies, mining companies, construction companies, the United States government, and power generation, nuclear and industrial companies.

The results of the distribution and services segment are largely tied to the industries it serves and, therefore, can be influenced by the cycles of such industries. No single customer of the distribution and services segment accounted for 10% or more of the Company's revenues in 2018, 2017 and 2016.

United has maintained continuous exclusive distribution rights for MTU and Allison Transmission products since 1946. United is one of MTU's top five distributors of MTU off-highway engines in North America with exclusive distribution rights in Oklahoma, Arkansas, Louisiana and Mississippi. In addition, as a distributor of Allison Transmission products, United has distribution rights in Oklahoma, Arkansas and Louisiana. Finally, United is also the distributor for parts service and warranty on Daimler Truck North America (DTNA) engines and related equipment in Oklahoma, Arkansas and Louisiana.

S&S is also one of MTU's top five distributors for off-highway engines with exclusive distribution rights in multiple states. S&S also has authorized exclusive distribution rights for Allison Transmission, Detroit Diesel, Deutz, DTNA, EMD, Rolls Royce Power and Volvo Penta diesel engines in multiple key growth states, primarily through the Central, South and Eastern parts of the United States and strategically located near major oil and gas fields, marine waterways and on-highway transportation routes. In addition, S&S has long-term relationships with numerous smaller suppliers including Donaldson, Freightliner, Generac and John Deere.

Kirby Engine Systems, through Marine Systems and Engine Systems, operates as an authorized EMD distributor throughout the United States. Engine Systems is also the authorized EMD distributor for nuclear power applications worldwide. The relationship with EMD has been maintained for 53 years. The segment also operates factory-authorized full service marine distributorship/dealerships for Cummins, Detroit Diesel and John Deere high-speed diesel engines and Falk, Lufkin and Twin Disc marine gears, as well as an authorized marine dealer for Caterpillar diesel engine in multiple states.

Weather can be a major factor in the day-to-day operations of the marine transportation segment. Adverse weather conditions, such as high or low water, tropical storms, hurricanes, tsunamis, fog and ice, can impair the operating efficiencies of the marine fleet. Shipments of products can be delayed or postponed by weather conditions, which are totally beyond the control of the Company. Adverse water conditions are also factors which impair the efficiency of the fleet and can result in delays, diversions and limitations on night passages, and dictate horsepower requirements and size of tows. Additionally, much of the inland waterway system is controlled by a series of locks and dams designed to provide flood control, maintain pool levels of water in certain areas of the country and facilitate navigation on the inland river system. Maintenance and operation of the navigable inland waterway infrastructure is a government function handled by the Army Corps of Engineers with costs shared by industry. Significant changes in governmental policies or appropriations with respect to maintenance and operation of the infrastructure could adversely affect the Company.

The Company's marine transportation segment is subject to regulation by the USCG, federal laws, state laws and certain international conventions, as well as numerous environmental regulations. The Company believes that additional safety, environmental and occupational health regulations may be imposed on the marine industry. There can be no assurance that any such new regulations or requirements, or any discharge of pollutants by the Company, will not have an adverse effect on the Company.

The Company's marine transportation segment competes principally in markets subject to the Jones Act, a federal cabotage law that restricts domestic marine transportation in the United States to vessels built and registered in the United States, and manned and owned by United States citizens. The Jones Act cabotage provisions occasionally come under attack by interests seeking to facilitate foreign flag competition in trades reserved for domestic companies and vessels under the Jones Act. The Company believes that continued efforts will be made to modify or eliminate the cabotage provisions of the Jones Act. If such efforts are successful, certain elements could have an adverse effect on the Company.

The Company has issued guaranties or obtained standby letters of credit and performance bonds supporting performance by the Company and its subsidiaries of contractual or contingent legal obligations of the Company and its subsidiaries incurred in the ordinary course of business. The aggregate notional value of these instruments is \$20,133,000 at December 31, 2018, including \$8,179,000 in letters of credit and \$11,954,000 in performance bonds. All of these instruments have an expiration date within two years. The Company does not believe demand for payment under these instruments is likely and expects no material cash outlays to occur in connection with these instruments.

(16) Segment Data

The Company's operations are aggregated into two reportable business segments as follows:

Marine Transportation — Provide marine transportation principally by United States flag vessels of liquid cargoes throughout the United States inland waterway system, along all three United States coasts, in Alaska and Hawaii and, to a lesser extent, in United States coastal transportation of dry-bulk cargoes. The principal products transported include petrochemicals, black oil, refined petroleum products and agricultural chemicals.

Distribution and Services — Provides after-market services and parts for engines, transmissions, reduction gears and related equipment used in oilfield service, marine, power generation, mining, on-highway, and other industrial applications. The Company also rents equipment including generators, fork lifts, pumps and compressors for use in a variety of industrial markets, and manufactures and remanufactures oilfield service equipment, including pressure pumping units, for the oilfield service and oil and gas operator and producer markets.

The Company's two reportable business segments are managed separately based on fundamental differences in their operations. The Company's accounting policies for the business segments are the same as those described in Note 1, Summary of Significant Accounting Policies. The Company evaluates the performance of its segments based on the contributions to operating income of the respective segments, and before income taxes, interest, gains or losses on disposition of assets, other nonoperating income, noncontrolling interests, accounting changes, and nonrecurring items. Intersegment revenues, based on market-based pricing, of the distribution and services segment from the marine transportation segment of \$29,363,000, \$20,717,000 and \$24,672,000 in 2018, 2017 and 2016, respectively, as well as the related intersegment profit of \$2,936,000, \$2,072,000 and \$2,467,000 in 2018, 2017 and 2016, respectively, have been eliminated from the tables below.

The following table sets forth by reportable segment the revenues, profit or loss, total assets, depreciation and amortization, and capital expenditures attributable to the principal activities of the Company for the years ended December 31, 2018, 2017 and 2016 (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Revenues:			
Marine transportation	\$ 1,483,143	\$ 1,324,106	\$ 1,471,893
Distribution and services	1,487,554	890,312	298,780
	<u>\$ 2,970,697</u>	<u>\$ 2,214,418</u>	<u>\$ 1,770,673</u>
Segment profit (loss):			
Marine transportation	\$ 147,416	\$ 135,547	\$ 259,453
Distribution and services	129,305	86,479	3,068
Other	(162,562)	(149,012)	(34,775)
	<u>\$ 114,159</u>	<u>\$ 73,014</u>	<u>\$ 227,746</u>
Total assets:			
Marine transportation	\$ 4,145,294	\$ 3,485,099	\$ 3,613,951
Distribution and services	1,653,636	1,567,085	623,268
Other	72,664	75,243	52,676
	<u>\$ 5,871,594</u>	<u>\$ 5,127,427</u>	<u>\$ 4,289,895</u>
Depreciation and amortization:			
Marine transportation	\$ 182,307	\$ 178,898	\$ 184,291
Distribution and services	39,349	20,387	12,833
Other	3,316	3,596	3,793
	<u>\$ 224,972</u>	<u>\$ 202,881</u>	<u>\$ 200,917</u>
Capital expenditures:			
Marine transportation	\$ 284,953	\$ 165,421	\$ 217,423
Distribution and services	10,742	5,086	5,915
Other	6,166	6,715	7,728
	<u>\$ 301,861</u>	<u>\$ 177,222</u>	<u>\$ 231,066</u>

The following table presents the details of “Other” segment profit (loss) for the years ended December 31, 2018, 2017 and 2016 (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
General corporate expenses	\$ (35,590)	\$ (18,202)	\$ (15,024)
Interest expense	(46,856)	(21,472)	(17,690)
Impairment of long-lived assets	(82,705)	(105,712)	—
Impairment of goodwill	(2,702)	—	—
Lease cancellation costs	(2,403)	—	—
Gain (loss) on disposition of assets	1,968	(4,487)	(127)
Other income (expense)	5,726	861	(1,934)
	<u>\$ (162,562)</u>	<u>\$ (149,012)</u>	<u>\$ (34,775)</u>

The following table presents the details of “Other” total assets as of December 31, 2018, 2017 and 2016 (in thousands):

	<u>2018</u>	<u>2017</u>	<u>2016</u>
General corporate assets	\$ 70,169	\$ 73,353	\$ 50,054
Investment in affiliates	2,495	1,890	2,622
	<u>\$ 72,664</u>	<u>\$ 75,243</u>	<u>\$ 52,676</u>

(17) Related Party Transactions

The Company is a 50% owner of The Hollywood Camp, L.L.C. (“The Hollywood Camp”), a company that owns and operates a hunting and fishing facility used by the Company primarily for customer entertainment. The Hollywood Camp allocates lease and lodging expenses to its members based on their usage of the facilities. The Company paid The Hollywood Camp \$4,523,000 in 2018, \$3,634,000 in 2017 and \$3,143,000 in 2016 for its share of facility expenses.

The Company is a 50% owner of Bolivar Terminal Co., Inc. (“Bolivar”), a company that provides barge fleetling services (temporary barge storage facilities) in the Houston, Texas area. The Company paid Bolivar \$461,000 in 2018, \$581,000 in 2017 and \$1,314,000 in 2016 for barge fleetling services. Such services were in the ordinary course of business of the Company.

The husband of Amy D. Husted, Vice President and General Counsel of the Company, is a partner in the law firm of Clark Hill Strasburger. The Company paid the law firm \$2,019,000 in 2018, \$830,000 in 2017 and \$779,000 in 2016 for legal services in connection with matters in the ordinary course of business of the Company.

(18) Subsequent Event

On January 29, 2019, the Company signed a definitive agreement to acquire the marine transportation fleet of Cenac Marine Services, LLC (“Cenac”) for approximately \$244,000,000 in cash, subject to certain closing adjustments. The purchase will be financed through additional borrowings. Cenac’s fleet consists of 63 inland 30,000 barrel tank barges with approximately 1.9 million barrels of capacity, 34 inland towboats and two offshore tugboats. Cenac moves petrochemicals, refined products and black oil, including crude oil, residual fuels, feedstocks and lubricants on the lower Mississippi River, its tributaries, and the Gulf Intracoastal Waterway for major oil companies and refiners. On February 11, 2019, the Federal Trade Commission granted the Company early termination of the Hart-Scott-Rodino waiting period for the acquisition of Cenac. The closing of the acquisition is expected to occur in March 2019.

PART IV**Item 15. Exhibits and Financial Statement Schedules****1. Financial Statements**

Included in Part III of this report:

Report of Independent Registered Public Accounting Firm.

Report of Independent Registered Public Accounting Firm.

Consolidated Balance Sheets, December 31, 2018 and 2017.

Consolidated Statements of Earnings, for the years ended December 31, 2018, 2017 and 2016.

Consolidated Statements of Comprehensive Income, for the years ended December 31, 2018, 2017 and 2016.

Consolidated Statements of Cash Flows, for the years ended December 31, 2018, 2017 and 2016.

Consolidated Statements of Stockholders' Equity, for the years ended December 31, 2018, 2017 and 2016.

Notes to Consolidated Financial Statements, for the years ended December 31, 2018, 2017 and 2016.

2. Financial Statement Schedules

All schedules are omitted as the required information is inapplicable or the information is presented in the consolidated financial statements or related notes.

3. Exhibits

Exhibit Number	Description of Exhibit
2.1	— Purchase and Sale Agreement, dated as of June 13, 2017, by and between Stewart & Stevenson LLC and Kirby Corporation (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed on June 15, 2017).
2.2	— Amendment No. 1 to Purchase and Sale Agreement, dated as of June 26, 2017, by and between Stewart & Stevenson LLC and Kirby Corporation (incorporated by reference to Exhibit 2.1 to the Registrant's Quarterly Report on Form 10-Q filed on August 7, 2017).
2.3	— Amendment No. 2 to Purchase and Sale Agreement, dated as of August 11, 2017, by and between Stewart & Stevenson LLC and Kirby Corporation (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed on August 14, 2017).
2.4	— Amendment No. 3 to Purchase and Sale Agreement, dated as of September 13, 2017, by and between Stewart & Stevenson LLC and Kirby Corporation (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed on September 14, 2017).
2.5	— Securities Purchase Agreement among Kirby Corporation, Higman Marine, Inc. and the parties named therein dated February 4, 2018 (incorporated by reference to Exhibit 2.5 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2017).

3.1	— Restated Articles of Incorporation of the Company with all amendments to date (incorporated by reference to Exhibit 3.1 to the Registrant’s Annual Report on Form 10-K for the year ended December 31, 2014).
3.2	— Bylaws of the Company, as amended to date (incorporated by reference to Exhibit 3.2 to the Registrant’s Annual Report on Form 10-K for the year ended December 31, 2014).
4.1	Long-term debt instruments are omitted pursuant to Item 601(b)(4) of Regulation S-K. The Registrant will furnish copies of such instruments to the Commission upon request.
10.1	— Credit Agreement dated as of April 30, 2015 among Kirby Corporation, JP Morgan Chase Bank, N.A., as Administrative Agent, and the banks named therein (incorporated by reference to Exhibit 10.1 to the Registrant’s Current Report on Form 8-K filed with the Commission on May 5, 2015).
10.2	— First Amendment to Credit Agreement dated as of June 26, 2017 among Kirby Corporation, JP Morgan Chase Bank, N.A., as Administrative Agent, and the banks named therein (incorporated by reference to Exhibit 10.1 to the Registrant’s Current Report on Form 8-K filed with the Commission on June 28, 2017).
10.3†	— Deferred Compensation Plan for Key Employees (incorporated by reference to Exhibit 10.7 to the Registrant’s Annual Report on Form 10-K for the year ended December 31, 2005).
10.4†	— Annual Incentive Plan Guidelines for 2018 (incorporated by reference to Exhibit 10.5 to the Registrant’s Annual Report on Form 10-K for the year ended December 31, 2017).
10.5†*	— Annual Incentive Plan Guidelines for 2019.
10.6†	— 2000 Nonemployee Director Stock Plan (incorporated by reference to Exhibit 10.1 to the Registrant’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2016).
10.7†	— 2005 Stock and Incentive Plan (incorporated by reference to Exhibit 10.7 to the Registrant’s Annual Report on Form 10-K for the year ended December 31, 2017).
10.8	— Nonemployee Director Compensation Program (incorporated by reference to Exhibit 10.2 to the Registrant’s Quarterly Report on Form 10-Q for the quarter ended March 31, 2018).
21.1*	— Consolidated Subsidiaries of the Registrant.
23.1*	— Consent of Independent Registered Public Accounting Firm.
31.1*	— Certification of Chief Executive Officer Pursuant to Rule 13a-14(a).
31.2*	— Certification of Chief Financial Officer Pursuant to Rule 13a-14(a).
32*	— Certification Pursuant to 18 U.S.C. Section 1350 (As adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002).

101.INS**	— XBRL Instance Document
101.SCH**	— XBRL Taxonomy Extension Schema Document
101.CAL**	— XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF**	— XBRL Taxonomy Extension Definitions Linkbase Document
101.LAB**	— XBRL Taxonomy Extension Label Linkbase Document
101.PRE**	— XBRL Taxonomy Extension Presentation Linkbase Document

* Filed herewith.

** These exhibits are furnished herewith. In accordance with Rule 406T of Regulations S-T, these exhibits are not deemed to be 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 not deemed to be 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.

† Management contract, compensatory plan or arrangement.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
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ANNUAL INCENTIVE PLAN

2019 Plan Year

Guidelines

KIRBY CORPORATION

January 2019

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Introduction

Kirby Corporation (together with its subsidiaries, “Kirby” or the “Company”) established the 2019 Annual Incentive Plan (the “Plan”) to focus employees of the Company on identifying and achieving business strategies that lead to increased stockholder value. The Plan is also intended to reward superior performance by employees and their contribution to achieving Kirby’s objectives.

Certain aspects of this Plan are complex. Although these Guidelines establish rules for Plan operation, those rules may not work in all circumstances. Therefore, the Compensation Committee of the Kirby Board of Directors has discretion to interpret these Guidelines to assure the awards are consistent with the Plan’s purposes and the Company’s interests. All decisions by the Compensation Committee shall be final and binding.

Unless resolutions of the Compensation Committee expressly provide otherwise, awards granted under the Plan shall constitute performance awards granted under Article IV of the Kirby Corporation 2005 Stock and Incentive Plan and are subject to the terms and provisions of such Plan that apply to performance awards.

The Plan may be amended, modified or terminated at any time without prior notice by written authorization of the Compensation Committee or the Board of Directors of Kirby Corporation.

The 2019 Annual Incentive Plan

Each award granted under the Plan is an award for Company performance or a combination of Company and Business Group performance. Awards are generally based on achieving the Company Performance Goal as well as additional Company, Business Group and individual performance measures and objectives. Once the Company Performance Goal is reached, participants in the Plan become eligible for an incentive bonus payment.

All amounts paid to participants pursuant to the Plan shall be subject to any policy relating to the recovery of erroneously awarded incentive compensation that may hereafter be adopted by the Company in order to comply with Securities and Exchange Commission rules or New York Stock Exchange listing standards.

Plan Objectives

The key objectives of the Plan are:

- Provide an annual incentive plan that drives performance toward objectives critical to creating stockholder value.
- Offer competitive cash compensation opportunities to key Kirby employees.
- Reward outstanding achievement by employees who directly affect Kirby's results.
- Assist Kirby in attracting and retaining high quality employees.
- Reflect both quantitative and qualitative performance factors in actual bonus payouts.
- Ensure that incentive payments made by the Company are fully deductible by the Company.

Business Groups

The following Business Groups¹ are designated for purposes of the Plan:

Kirby Corporate Services ("KCS")	United Holdings LLC/Stewart & Stevenson LLC ("United/S&S")
Kirby Inland Marine, LP ("KIM")	Kirby Engine Systems, Inc. ("KES")
Kirby Offshore Marine, LLC ("KOM")	

Kirby Ocean Transport Company and Osprey Line, L.L.C. are considered part of the KIM Business Group for purposes of the Plan.
¹ San Jac Marine, LP will not participate in this incentive plan in 2019

Performance Period

Performance is measured on a calendar year basis for the Plan. The Performance Period begins on January 1, 2019 and ends on December 31, 2019. Except as expressly provided in these Guidelines in the case of new employees or termination of employment, incentive compensation payments under the Plan are for the full year 2019 and shall not be reduced for the period between the commencement of the Performance Period and the date on which the Compensation Committee approves these Guidelines and the individual bonus targets for participants in the Plan.

Eligibility

- Generally, managerial employees and KIM wheelhouse employees classified as Captain, Relief Captain or Pilot, are eligible for participation. Selection for participation in the Plan is based upon each position's ability to impact long-term financial results of the Company and designation by management. Some employees in managerial positions might not be included in the Plan.
- In order to be eligible to receive an incentive payment under the Plan, participants must be employed on the last day of the Performance Period and on the date bonuses are actually paid for the Performance Period, unless their earlier termination is due to death, normal retirement or disability. If a participant's employment is terminated prior to the last day of the Performance Period, or prior to the date of payment, for any reason other than death, normal retirement or disability, any bonus the participant may otherwise have received will be forfeited and the participant will have no right to any incentive payment under the Plan. As used in the Plan, the terms "normal retirement" and "disability" have the same meanings as in the Kirby Profit Sharing Plan in the case of shore-based employees and in the Kirby Pension Plan in the case of vessel employees.
- Participation in the Plan in 2019 does not guarantee participation in similar plans in future years. Participants in the Plan or in similar plans in future years will be notified annually of their selection for participation.

Individual Bonus Targets

Each participant will be assigned a target bonus level defined as a percentage of base salary earned during the Performance Period. This bonus target is based on competitive market practices, as well as the employee's ability to impact long-term Company performance. Market practices will be determined using data from either general industry, the marine transportation industry or the diesel engine services industry, depending upon the individual position being considered.

Aggregate Payment Amount

At the end of the year, a preliminary incentive payment amount will first be calculated for each participant in the Plan in order to determine the Aggregate Payment Amount for all participants for the year. The preliminary incentive payment amount for each participant will be calculated as of December 31, 2019 based on the target incentive level for such participant and the calculation formulas described in these Guidelines. The Aggregate Payment Amount under the Plan shall equal the sum of all of such preliminary incentive payment amounts.

The Company will be obligated to pay out the full Aggregate Payment Amount to eligible participants, subject to the discretion of the Compensation Committee, and the Chief Executive Officer to the extent authorized under these Guidelines, with respect to the allocation of the Aggregate Payment Amount among individual participants. Therefore, the Company's obligation to pay out the Aggregate Payment Amount becomes fixed on the last day of the Performance Period.

The Compensation Committee, and the Chief Executive Officer if applicable, may determine the amount of the bonus paid to any participant based on the performance measures described in the Plan or any other criteria deemed appropriate in its discretion, provided that in no event will the aggregate incentive payments made pursuant to the Plan exceed the Aggregate Payment Amount.

Performance Measures

The performance measures for the Plan are:

- EBITDA
- Return on total capital
- Earnings per share

Annual performance targets will be established for each measure based on Kirby's budget for the year and each of the performance measures will have the following weight in calculating the preliminary incentive payment amount for each participant:

Measure	Weight
Applies to Business Groups: KCS and KIM	
EBITDA	
(Earnings before interest, taxes, depreciation and amortization)	33.33%
Return on Total Capital ("ROTC")	
(Earnings before interest and taxes divided by average beginning and ending stockholders' equity plus long-term debt)	33.33%
Earnings per share	33.33%
	100%
Applies to Business Group: United, S&S, and KES	
EBITDA	50%
ROTC	50%
	100%
Applies to Business Groups: KOM	
EBITDA	100%

Business Group Weighting

Calculation of the preliminary incentive payment amount for Business Group employees will be based primarily on Business Group performance with a defined portion based on Company performance. Calculation of the preliminary incentive payment amount for employees of KCS will be based on Company performance. Specific weightings are set forth in the following table:

Employee/Business Group with Associated Weighting					
	Company	KIM	KOM	KES	United/S&S
KCS	100%				
KIM	30%	70%			
KOM	30%		70%		
KES	30%			70%	
United/S&S	30%				70%
Marine Shared	30%	50%	20%		
D&S Shared	30%			15%	55%
Marine President	50%	35%	15%		
President of D&S	50%			10%	40%
Controller of D&S	30%			15%	55%
Head of HR of D&S	30%			15%	55%
President of KES	50%			50%	

Performance Standards for Incentive Payment Calculations

For KIM and KCS			
Performance Level	Definition	Relationship to Budget	% of Target Used for Calculation
Below Threshold	Performance did not meet minimum metric	less than 80% of budget	0%
Threshold	Minimum acceptable performance for payout	80% of budget	50%
Target	Expected performance at stretch level	100% of budget	100%
Maximum	Outstanding performance	120% of budget	200%

For United, S&S and KES			
Performance Level	Definition	Relationship to Budget	% of Target Used for Calculation
Below Threshold	Performance did not meet minimum metric	less than 75% of budget	0%
Threshold	Minimum acceptable performance for payout	75% of budget	50%
Target	Expected performance at stretch level	100% of budget	100%
Maximum	Outstanding performance	125% of budget	200%

For KOM			
Performance Level	Definition	Relationship to Budget	% of Target Used for Calculation
Below Threshold	Performance did not meet minimum metric	less than 60% of budget	0%
Threshold	Minimum acceptable performance for payout	60% of budget	50%
Target	Expected performance at stretch level	100% of budget	100%
Maximum	Outstanding performance	140% of budget	200%

Between the threshold and maximum percentages of budget achieved for each performance measure, there is a linear relationship between the percentage of budget achieved and the resulting percentage of the target payout percentage used in calculating payout amounts. As examples, 90% of budget for KIM would result in 75% of target used in the calculation of a preliminary payment amount and 105% of budget would result in 125% of target used for the calculation of a preliminary payment amount.

- The target amount determined for each performance measure is then multiplied by the weight for the performance measure and the results are added together to produce a total Company or Business Group payout percentage of the target incentive that is applied to each individual participant in order to calculate the Aggregate Payout Amount under the Plan.
- The Compensation Committee and the Chief Executive Officer shall in their discretion allocate the Aggregate Payment Amount among eligible participants; provided that only the Compensation Committee shall have the authority to allocate payment amounts to eligible participants (i) who are “officers” for purposes of Section 16 of the Securities Exchange Act of 1934, (ii) whose bonus target is 50% or more of base salary or (iii) whose base salary is \$250,000 or more (collectively “Specified Participants”). In allocating the Aggregate Payment Amount, the Compensation Committee and the Chief Executive Officer may consider, but shall not be bound by, the preliminary incentive payment amount calculated for each participant.
- The Compensation Committee has discretion to modify the performance measures or adjust the calculation of the preliminary incentive payment amounts to adjust for acquisitions, divestitures and other material business events.
- The aggregate amount of incentive payments made to participants in the Plan must equal the Aggregate Payment Amount.
- Notwithstanding the foregoing or any provision of the Plan to the contrary, no participant may receive an amount in excess of 200% of the individual bonus target established for such participant (the “Maximum Payment”).

Administration

Incentive Payments

A participant’s final incentive bonus payment is paid out in cash within 90 days following the end of the Company’s fiscal year, based on audited financial statements of the Company.

Eligibility Limitation

Participants must be employed by the Company on the last day of the Performance Period and on the date bonuses are actually paid in order to receive a bonus, unless otherwise provided for in the Plan.

Special Circumstances

The Compensation Committee will have the sole authority to resolve disputes related to Plan administration. Decisions made by the Compensation Committee will be final and binding on all participants. The Compensation Committee has the sole discretion to determine the bonuses for newly hired, terminated, transferred and promoted employees, but will generally award bonuses based on the following provisions.

New Employees

For employees hired after the beginning of a Performance Period who are selected for participation in the Plan, the preliminary incentive payment will be prorated for the portion of the Performance Period during which they were employees of the Company, subject to the Termination of Employment restrictions.

Termination of Employment

If a participant's employment terminates prior to the last day of the Performance Period or prior to the date bonuses are actually paid for the Performance Period, for any reason other than death, normal retirement or disability, the participant will be ineligible to receive a bonus.

If a participant's employment terminates before the end of the full Performance Period or before the date bonuses are actually paid for the Performance Period as a result of death, normal retirement or disability, the preliminary incentive payment for the participant (or the participant's heirs) will be prorated at the end of the Performance Period based upon actual performance and base wages earned while employed during the Performance Period.

Transfer

The preliminary incentive payment for a participant who is transferred between Business Groups during the year will be a weighted bonus based upon the time spent at each of the Business Groups. In calculating a weighted bonus, relevant Company and Business Group performance measures will be calculated for the full Performance Period and then a blended bonus will be calculated based on the time spent at each Business Group.

Promotions

The preliminary incentive payment for a participant who is promoted or reassigned during any Performance Period and whose bonus target is subsequently increased or decreased will be a weighted bonus, based on the service before and after the promotion or reassignment.

Compensation Committee

The Plan shall be administered by the Compensation Committee. The Compensation Committee shall have the authority to interpret the provisions of the Plan and these Guidelines, to adopt such rules for carrying out the Plan as it may deem advisable, to decide conclusively all questions arising with respect to the Plan and to make all other determinations and take all other actions necessary or desirable for the administration of the Plan. All decisions and acts of the Compensation Committee shall be final and binding upon all affected parties.

In administering the Plan the Compensation Committee will:

- Approve the designation of Business Groups within the Company
- Approve the Company Performance Goal
- Approve other performance measures used and the Threshold, Target and Maximum budget performance levels for purposes of calculating preliminary incentive payment amounts and the Aggregate Payment Amount

- Approve linkage for participants to Company and Business Group performance
- Approve the individual bonus targets for all Specified Participants
- Approve the Aggregate Payment Amount to be paid to participants in the Plan
- Determine in its discretion the final incentive payments for participants.

The total amount of the incentive payments made to participants pursuant to the Plan must equal, and may not exceed, the Aggregate Payment Amount.

Chief Executive Officer (CEO)

The CEO has primary responsibility for recommending Plan Guidelines to the Committee and for delegating administrative duties associated with the Plan. The Compensation Committee may delegate additional administrative duties to the CEO or any Company officer. The CEO may make recommendations, subject to Compensation Committee approval, with respect to the incentive payment to any participant.

Chief Financial Officer (CFO)

The CFO is responsible for calculating performance under the Plan. The CFO will:

- Provide annual reports to the Compensation Committee and the CEO on each Business Group's performance at the end of the fiscal year
- Maintain a financial information system that reports results on an estimated quarterly and annual basis
- Coordinate with the Company's auditors to properly recognize any accounting expense associated with incentive payments under the Plan
- Provide the VP – of HR with the performance results of each Business Group as well as overall Company performance

Chief Human Resources Officer (CHRO)

The CHRO has responsibility for administration of the Plan and will:

- Develop and recommend eligible participants and target bonus guidelines
- Coordinate communications with participants, including materials to facilitate understanding the Plan's objectives and goals
- Calculate participants' preliminary incentive payment amounts, using the performance factors provided by the CFO
- Process paperwork approving individual incentive payments

Business Group Presidents and Vice Presidents will:

- Recommend participants in the Plan
- Coordinate with the CFO to determine any significant changes in business conditions for purposes of reviewing the Threshold, Target and Maximum performance objectives
- Assure that participants are informed of the actual incentive payment to be made for the Performance Period

KIRBY CORPORATION
CONSOLIDATED SUBSIDIARIES OF THE REGISTRANT

	Domicile of Incorporation
KIRBY CORPORATION – PARENT AND REGISTRANT	Nevada
SUBSIDIARIES OF THE PARENT AND REGISTRANT	
Kirby Corporate Services, LLC	Delaware
KIM Holdings, Inc.	Delaware
Kirby Terminals, Inc.	Texas
Sabine Transportation Company	Delaware
AFRAM Carriers, Inc.	Delaware
Kirby Distribution & Services, Inc.	Delaware
Kirby Tankships, Inc.	Delaware
Kirby Ocean Transport Company	Delaware
Kirby Offshore Marine, LLC	Delaware
K Equipment, LLC	Delaware
Osprey Line, L.L.C. (66 2/3%)	Texas
CONTROLLED CORPORATIONS	
KIM Partners, LLC (Subsidiary of KIM Holdings, Inc.)	Louisiana
Kirby Inland Marine, LP (KIM Holdings, Inc. 1% General Partner, KIM Partners, LLC 99% Limited Partner)	Delaware
Greens Bayou Fleeting, LLC (subsidiary of Kirby Inland Marine, LP)	Texas
Dixie Carriers, Inc. (subsidiary of Kirby Inland Marine, LP)	Texas
San Jac Marine, LLC (subsidiary of Kirby Inland Marine, LP)	Delaware
Kirby Engine Systems LLC (subsidiary of Kirby Distribution & Services, Inc.)	Delaware
Marine Systems, Inc. (subsidiary of Kirby Engine Systems LLC)	Louisiana
Engine Systems, Inc. (subsidiary of Kirby Engine Systems LLC)	Delaware
United Holdings LLC (subsidiary of Kirby Distribution & Services, Inc.)	Delaware
United Engines LLC (subsidiary of United Holdings LLC)	Colorado
UE Manufacturing LLC (subsidiary of United Holdings LLC)	Colorado
Compression Systems LLC (subsidiary of United Holdings LLC)	Colorado
Thermo King of Houston, LP (subsidiary of United Holdings LLC)	Texas
San Antonio Thermo King, Inc. (subsidiary of Thermo King of Houston, LP)	Texas
Kirby Offshore Marine Operating, LLC (subsidiary of Kirby Offshore Marine, LLC)	Delaware
Kirby Offshore Marine Hawaii, LLC (subsidiary of Kirby Offshore Marine Operating, LLC)	Delaware
Kirby Offshore Marine Pacific, LLC (subsidiary of Kirby Offshore Marine Operating, LLC)	Delaware
Kirby Offshore Marine, Inc. (subsidiary of Kirby Offshore Marine Operating, LLC)	Delaware
Inversiones Kara Sea SRL (subsidiary of Kirby Offshore Marine Operating, LLC)	Venezuela
K-Sea Canada Holdings, Inc. (subsidiary of Kirby Offshore Marine, Inc.)	Delaware
K-Sea Canada Corp. (subsidiary of K-Sea Canada Holdings, Inc.)	Nova Scotia
Penn Maritime Inc. (subsidiary of Kirby Offshore Marine, LLC)	Delaware
Stewart & Stevenson LLC (subsidiary of Kirby Distribution & Services, Inc.)	Delaware
Stewart & Stevenson Power Products LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson Canada Inc. (subsidiary of Stewart & Stevenson LLC)	Canada
Stewart & Stevenson de las Americas Colombia Ltda. (Stewart & Stevenson Petroleum Services LLC 1% General Partner, Stewart & Stevenson LLC 99% Limited Partner)	Colombia
Stewart & Stevenson de Venezuela, S.A. (subsidiary of Stewart & Stevenson LLC)	Venezuela
Stewart & Stevenson Material Handling LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Hunt Power Systems LLC (subsidiary of Stewart & Stevenson LLC)	Delaware

Stewart & Stevenson Petroleum Services LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson Distributor Holdings LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson Finance LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson Manufacturing Technologies LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson Acquisition LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson Rentals LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Stewart & Stevenson FDDA LLC (subsidiary of Stewart & Stevenson LLC)	Delaware
Transmissions Y Embragues, S.A. (subsidiary of Stewart & Stevenson de Venezuela, S.A.)	Venezuela
Stewart & Stevenson Hong Kong Limited (subsidiary of Stewart & Stevenson Petroleum Services LLC)	Hong Kong
Higman Marine, Inc. (subsidiary of Kirby Inland Marine, LP)	Delaware
Higman Barge Lines, Inc. (subsidiary of Higman Marine, Inc.)	Delaware
Higman Marine Services, Inc. (subsidiary of Higman Marine, Inc.)	Delaware
Higman Service Corporation (subsidiary of Higman Marine, Inc.)	Delaware
Alamo Barge Lines, LLC (subsidiary of Kirby Inland Marine, LP)	Delaware
16530 Peninsula Blvd. LLC (subsidiary of Kirby Inland Marine, LP)	Texas
Empty Barge Lines, Inc. (subsidiary of Kirby Inland Marine, LP)	Texas
Empty Barge Lines II, Inc. (subsidiary of Kirby Inland Marine, LP)	Texas
Empty Barge Lines III, Inc. (subsidiary of Kirby Inland Marine, LP)	Texas
EBL Marine I LLC (subsidiary of Kirby Inland Marine, LP)	Texas
EBL Marine II LLC (subsidiary of Kirby Inland Marine, LP)	Texas
EBL Marine III LLC (subsidiary of Kirby Inland Marine, LP)	Texas
Hollywood Chem 107, Ltd (90.8%)	Texas
Hollywood Chem 108, Ltd (93.1%)	Texas

Consent of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
Kirby Corporation:

We consent to the incorporation by reference in the registration statements (No. 333-57625, No. 333-72592, No. 333-129290, No. 333-129333, No. 333-152565, No. 333-152566, No. 333-184598 and No. 333-184599) on Form S-8 and (No. 333-220974 and No. 333-222858) on Form S-3 of Kirby Corporation of our reports dated February 25, 2019, with respect to the consolidated balance sheets of Kirby Corporation and consolidated subsidiaries as of December 31, 2018 and 2017, and the related consolidated statements of earnings, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and the effectiveness of internal control over financial reporting as of December 31, 2018, which reports appear in the December 31, 2018 annual report on Form 10-K of Kirby Corporation.

Our report dated February 25, 2019, on the effectiveness of internal control over financial reporting as of December 31, 2018, expresses our opinion that Kirby Corporation and consolidated subsidiaries did not maintain effective internal control over financial reporting as of December 31, 2018 because of the effect of a material weakness on the achievement of the objectives of the control criteria and contains an explanatory paragraph that states the Company's assessment of changes in internal control related to a recently acquired subsidiary's information technology general controls did not timely identify inappropriate user access issues at the subsidiary. Specifically, the Company did not design and maintain user access controls that adequately restricted user and privileged access to certain IT operating systems, databases and IT applications at this subsidiary. As a result, process level automated controls and manual controls that are dependent on the completeness and accuracy of information derived from the affected IT systems were also ineffective because they could have been adversely impacted.

/s/ KPMG LLP

Houston, Texas
February 25, 2019

CERTIFICATION OF CHIEF EXECUTIVE OFFICER

In connection with the filing of the report on Form 10-K for the year ended December 31, 2018 by Kirby Corporation, David W. Grzebinski certifies that:

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

/s/ DAVID W. GRZEBINSKI

David W. Grzebinski
President and Chief Executive Officer

Dated: February 25, 2019

CERTIFICATION OF CHIEF FINANCIAL OFFICER

In connection with the filing of the report on Form 10-K for the year ended December 31, 2018 by Kirby Corporation, William G. Harvey certifies that:

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

/s/ WILLIAM G. HARVEY

William G. Harvey
*Executive Vice President and
Chief Financial Officer*

Dated: February 25, 2019

Certification Pursuant to Section 18 U.S.C. Section 1350
(As adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002)

In connection with the filing of the Annual Report on Form 10-K for the year ended December 31, 2018 (the "Report") by Kirby Corporation (the "Company"), each of the undersigned hereby certifies that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ DAVID W. GRZEBINSKI

David W. Grzebinski
President and Chief Executive Officer

/s/ WILLIAM G. HARVEY

William G. Harvey
*Executive Vice President and
Chief Financial Officer*

Dated: February 25, 2019
