Koppers Holdings Inc.
Form 10-K
March 01, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 2018

Commission file number 1-32737

KOPPERS HOLDINGS INC.

(Exact name of registrant as specified in its charter)

Pennsylvania (State of incorporation)	20-1878963 (IRS Employer Identification No.)
436 Seventh Avenue	
Pittsburgh, Pennsylvania 15219 (Address of principal executive offices)	(412) 227-2001 (Registrant's telephone number, including area code)

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

Common Stock, par value $0.01 per share	New York Stock Exchange
Title of Each Class	Name of Exchange on which registered

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 Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports) and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).   Yes   No

Indicate by check mark 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 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, a smaller reporting company, or emerging growth company. See the definitions of "large accelerated filer", "accelerated filer", "smaller reporting company", and "emerging growth company" in Rule 12b-2 of the Exchange Act.:

Large accelerated filer   Accelerated filer   Non-accelerated filer   Smaller reporting company

Emerging Growth Company

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

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

The aggregate market value of shares of Common Stock held by non-affiliates of the registrant, based on the closing sales price of the Common Stock on the New York Stock Exchange on June 29, 2018 was $777.9 million (affiliates, for this purpose, have been deemed to be Directors and executive officers of Koppers Holdings Inc.).

As of January 31, 2019, 20,548,744 shares of Common Stock of the registrant were issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the 2019 Annual Meeting of Shareholders are incorporated by reference into Part III of this Annual Report on Form 10-K.

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FORWARD-LOOKING STATEMENTS

This report and the documents incorporated herein by reference contain “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995 and may include, but are not limited to, statements about sales levels, restructuring, profitability and anticipated synergies, expenses and cash outflows. All forward-looking statements involve risks and uncertainties. All statements contained herein that are not clearly historical in nature are forward-looking, and words such as “believe”, “anticipate”, “expect”, “estimate”, “may”, “will”, “shoul “continue”, “plan”, “intend”, “likely” or other similar words or phrases are generally intended to identify forward-looking statements. Any forward-looking statement contained herein, regarding expectations with respect to sales, earnings, cash flows, operating efficiencies, product introduction or expansion, the benefits of acquisitions and divestitures or other matters, are subject to known and unknown risks, uncertainties and contingencies.

Many of these risks, uncertainties and contingencies are beyond our control, and may cause actual results, performance or achievements to differ materially from anticipated results, performance or achievements. Factors that might affect such forward-looking statements include, among other things:

- availability of and fluctuations in the prices of key raw materials, including coal tar, lumber and scrap copper;
- the impact of changes in commodity prices, such as oil, copper and chemicals, on product margins;
- the ratings on our debt and our ability to repay or refinance our outstanding indebtedness as it matures;
- our ability to operate within the limitations of our debt covenants;
- capital market conditions, including interest rates, borrowing costs and foreign currency rate fluctuations;
- general economic and business conditions, including demand for our goods and services;
- potential difficulties in protecting intellectual property;
- potential impairment of our goodwill and/or long-lived assets;
- the effects of competition in the industries in which we operate, including locations of competitors and operating and market competition;
- economic, political and environmental conditions in international markets, including governmental changes, tariffs, restrictions on trade and restrictions on the ability to transfer capital across countries;
- changes in laws, including tax regulations or accounting standards, third-party relations and approvals, and decisions of courts, regulators and governmental bodies;
- parties who are obligated to indemnify us for liabilities, including legal and environmental liabilities, fail to perform under their legal obligations;
- unfavorable resolution of litigation against us;
- the other factors set forth under “Risk Factors”; as well as those discussed more fully elsewhere in this Form 10-K.

We caution you that the foregoing list of important factors may not contain all of the material factors that are important to you. In addition, in light of these risks and uncertainties, the matters referred to in the forward-looking statements contained in this report and the documents incorporated by reference herein may not in fact occur. We undertake no obligation to publicly update or revise any forward-looking statement as a result of new information, future events or otherwise, except as otherwise required by law.

PART I

ITEM 1. BUSINESS

General

In this report, unless otherwise noted or the context otherwise requires, (i) the term “Koppers”, “Koppers Holdings”, the “Company”, “we” or “us” refers to Koppers Holdings Inc. and its consolidated subsidiaries, (ii) the term “KH” refers to Koppers Holdings Inc. and not any of its subsidiaries and (iii) the term “KI” refers to Koppers Inc. and not any of its subsidiaries. Koppers Inc. is a wholly-owned subsidiary of Koppers Holdings Inc. Koppers Holdings Inc. has substantially no operations independent of Koppers Inc. and its subsidiaries. The use of these terms is not intended to imply that Koppers Holdings and Koppers Inc. are not separate and distinct legal entities from each other and from their respective subsidiaries. Koppers Holdings Inc. was incorporated in November 2004 as a holding company for Koppers Inc.

We are a leading integrated global provider of treated wood products, wood treatment chemicals, and carbon compounds. Our products and services are used in a variety of niche applications in a diverse range of end-markets, including the railroad, specialty chemical, utility, residential lumber, agriculture, aluminum, steel, rubber, and construction industries. We serve our customers through a comprehensive global manufacturing and distribution network, with manufacturing facilities located in North America, South America, Australasia, China and Europe.

Acquisitions

In April 2018, we re-entered the North American utility pole market with the acquisition of Cox Industries, Inc., which has been renamed Koppers Utility and Industrial Products Inc. (“UIP”). UIP manufactures and sells utility poles and construction and marine pilings through a network of eight manufacturing facilities and 19 distribution yards located throughout the United States. In February 2018, Koppers Inc. acquired M.A. Energy Resources, LLC, a business related to the recovery of used crossties, which was renamed Koppers Recovery Resources LLC (“KRR”) subsequent to the acquisition. The total acquisition cost for these two transactions was cash of approximately $264 million.

Business Segments and Products

We operate three principal business segments: Railroad and Utility Products and Services (“RUPS”), Performance Chemicals (“PC”), and Carbon Materials and Chemicals (“CMC”).

We believe our three business segments command leading market positions. Through our RUPS business, we believe that we are the largest supplier of railroad crossties to the North American railroads. Through our CMC business, we believe we are the largest global supplier of creosote to the North American railroad industry. Through our PC business, we believe that we are the largest global manufacturer and supplier of water-based wood preservatives and wood specialty additives to treaters who supply the residential, agricultural and industrial pressure-treated wood markets.

Our RUPS and CMC operations are, to a substantial extent, vertically integrated. Through our CMC business, we process coal tar into a variety of products, including creosote, which is an intermediate material necessary in the pressure treatment of wood crossties and other related railroad products. The majority of the creosote we produce in North America and Europe is sold internally to our RUPS business for treating railroad crossties.

Railroad and Utility Products and Services

Our RUPS business sells treated and untreated wood products, rail joint bars and services primarily to the railroad markets in the United States and Canada and the utility markets in the United States and Australia. We also operate a railroad services business that conducts engineering, design, repair and inspection services for railroad bridges and a business related to the recovery of used crossties, serving the same customer base as our North American railroad business.

Railroad products and services include procuring and treating items such as crossties, switch ties and various types of lumber used for railroad bridges and crossings. Railroad products also include manufacturing and selling rail joint bars, which are steel bars used to join rails together for railroads. Utility products, located in the United States and Australia, include the pressure treatment of transmission and distribution poles for electric and telephone utilities. The RUPS business operates 21 wood treating plants and one rail joint bar manufacturing facility located throughout the United States, Canada and Australia. Our network of plants is strategically located near timber supplies to enable us to access raw materials and service customers effectively. In addition, our crosstie treating plants are typically adjacent to our largest railroad customers' rail lines.

Our RUPS business manufactures its primary products and sells them directly to our customers through long-term contracts and purchase orders negotiated by our regional sales personnel and coordinated through our marketing group at corporate headquarters.

Hardwoods, such as oak and other species, are the major raw materials in wood crossties. Hardwood prices, which account for more than 50 percent of a finished crosstie's cost, fluctuate with the demand from other hardwood lumber markets, such as oak flooring, pallets and other specialty lumber products. Weather conditions can be a factor in the supply of raw material, as unusually wet or inclement conditions may make it difficult to harvest timber.

In the United States, hardwood lumber for crossties is procured by us from hundreds of small sawmills throughout the northeastern, midwestern and southern areas of the country. The crossties are shipped via rail car or trucked directly to one of our crosstie treating plants, all of which are on line with a major railroad. The crossties are either air-stacked for a period of six to nine months or artificially dried by a process called boultonizing. Once dried, the crossties are pressure treated with creosote, a product of our CMC business. A substantial portion of our crossties are treated with borate, which is purchased from PC, in combination with creosote.

We believe we are the largest supplier of railroad crossties in North America. We have one principal competitor, Stella-Jones Inc., and several smaller regional competitors in the North American market. Competitive factors in the railroad crosstie market include price, quality, location, service and security of supply. We believe we have a competitive advantage due to our ability to obtain internally-sourced creosote and our national network of treating plants which have direct access to our major customers' rail lines. These advantages provide for security of supply and logistics advantages for our customers.

Our RUPS business' largest customer base is the North American Class I railroad market, which buys approximately 70 percent of all crossties produced in the United States and Canada. Approximately 70 percent of our North American RUPS sales are under long-term contracts and we currently supply all North American Class I railroads. We also have relationships with many of the approximately 550 short-line and regional rail lines. This also forms the customer base for our rail joint bar products. The railroad crosstie market trended lower in 2018, with approximately 21.2 million replacement crossties purchased during the year, down from 23.4 million and 24.2 million purchased during 2017 and 2016, respectively.

Demand for railroad crossties may decline during winter months due to inclement weather conditions which make it difficult to harvest lumber and to install railroad crossties. As a result, operating results may vary from quarter to quarter depending on the severity of weather conditions and other variables affecting our products.

We believe our North American utility pole business is the second largest producer of utility poles in the United States, and we believe our Australian utility pole business is the largest producer of utility poles for the electrical communications utilities in Australia. Utility poles are produced mainly from pine species in the United States and the eucalyptus species in Australia. Most of these poles are purchased from large timber owners and individual landowners and shipped to one of our pole-peeling facilities. In North America and Australia, in addition to utility poles, we market smaller poles to the agricultural landscape and vineyard markets. We treat poles with a variety of preservatives, including chromated copper arsenates and creosote, which we produce internally and purchase from PC and CMC, respectively, and pentachlorophenol, which we purchase from an outside supplier.

Performance Chemicals

Our PC business maintains sales and manufacturing operations in the United States, Canada, Europe, South America, Australia and New Zealand. The primary products supplied by PC are copper-based wood preservatives, including micronized copper quaternary and micronized copper azole ("MicroPro®"), micronized pigments (MicroShades®), alkaline copper quaternary, amine copper azole and chromated copper arsenate. The primary applications for these products include decking, fencing, utility poles, construction lumber and timbers, and vineyard stakes. Additionally, we are now a leading supplier of fire-retardant chemicals for pressure treatment of wood, primarily in commercial construction, where applicable. Because we are a global supplier of wood preservatives, we face various competitors in all the geographic regions in which we participate.

PC supplies nine of the ten largest lumber treating companies in the United States, the largest treated wood market in the world, in addition to the three largest lumber treating companies in Canada. In North America, our PC business is vertically integrated through the manufacturing of copper compounds for our copper-based wood preservatives. We purchase over 35 million pounds of scrap copper or other compounds containing copper, our key raw material, which we process to meet the annual demand of this major market. When we purchase scrap copper, it is shipped to our manufacturing plants in Hubbell, Michigan and Millington, Tennessee for further processing into other copper compounds. We utilize swap contracts to hedge our exposure to copper price risk.

We believe that being vertically integrated in copper manufacturing provides PC with an important competitive advantage and also provides our customers with the security of a continuous supply of wood preservatives. Likewise, we believe that our marketing, engineering, and technical support services provide added value to our customer base, who supply pressure-treated wood products to large retailers and independent lumber dealers. We believe another competitive advantage is provided by our strategic sourcing group, which procures scrap copper and other raw materials, such as chromic acid, tebuconazole, arsenic trioxide, dispersants and various biocides and co-biocides through the global market.

Carbon Materials and Chemicals

Our CMC business manufactures its primary products and sells them directly to our global customer base under long-term contracts or through purchase orders negotiated by our regional sales personnel and coordinated through our global marketing group in the United States. Our four coal tar distillation facilities and five carbon materials terminals give us the ability to offer customers multiple sourcing options and a consistent supply of high-quality products.

For the past decade, the coal tar distillation industry has operated in an excess capacity mode, which further increased the competition for a limited amount of coal tar in North America and Europe. In 2014, we embarked on a plan to restructure our CMC operating footprint that reduced our global number of coal tar distillation facilities from the 11 that existed as of January 1, 2014 to four in total as of December 31, 2018. Our CMC business has experienced challenges over the past several years due to the closure of aluminum smelters that has occurred in North America, Western Europe and Australia. The smelting of aluminum requires significant amounts of energy, which is a major cost component for the aluminum industry. As a result, new production facilities are being built in regions with low energy costs such as the Middle East, while regions with higher energy costs such as North America, Western Europe and Australia have seen significant amounts of smelting capacity idled or closed over the last several years.

Our CMC business manufactures the following principal products:

- creosote, used in the treatment of wood or as a feedstock in the production of carbon black;
- carbon pitch, a critical raw material used in the production of aluminum and steel;
- naphthalene, used as a feedstock in the production of phthalic anhydride and as a surfactant in the production of concrete, and
- phthalic anhydride, used in the production of plasticizers, polyester resins and alkyd paints, respectively.

Creosote, carbon pitch, naphthalene, and carbon black feedstock are produced through the distillation of coal tar, a by-product generated through the processing of coal into coke for use in steel and iron manufacturing. Coal tar distillation involves the conversion of coal tar into a variety of intermediate chemical products in processes beginning with distillation. During the distillation process, heat and vacuum are utilized to separate coal tar into three primary components: chemical oils, distillate, and carbon pitch.

In the United States, our primary coal tar raw material supply contracts generally have terms ranging from three to ten years, and most provide options for renewal. Pricing under these contracts is either formula-based or negotiated on a quarterly or semi-annual basis. Our primary European tar supply contract has a remaining term of approximately eight years, extending indefinitely thereafter unless terminated by a one-year advance notice, and contains formula-based tar pricing. Our primary Australian supply contracts have terms ranging from five to ten years and contain formula-based pricing which is adjusted on an annual or semi-annual basis. Finally, in China, we have a raw material contract in place with our joint venture partner. This contract is coterminous with the applicable joint venture arrangement and provides for formula-based pricing adjusted on a monthly or quarterly basis.

Technology and Licensing

In 1988, we acquired the “Koppers” trademark from Koppers Company, Inc. The association of the name with the chemical, building, wood preservation and coke industries is beneficial to our company, as it represents long-standing, high quality products. Trademarks relating to our PC business, such as “MicroPro®”, “FlamePro®”, “Protim” and “Solignum” are important in this segment of our business, and as long as we continue to use the name “Koppers” and the trademarks associated with our wood preservation business and comply with applicable registration requirements, our right to use the name “Koppers” and the other trademarks should continue without expiration. The expiration of other trademark rights is not expected to materially affect our business.

Backlog

Generally, Koppers does not manufacture its products against a backlog of orders. Inventory and production levels are typically driven by expectations of future demand based on contractual obligations. Our RUPS business carries significant amounts of untreated crosstie inventory, which typically requires air-seasoning for a period of six- to nine-months.

Seasonality

Demand for residential, commercial, and agricultural treated lumber may decline during winter months due to weather conditions. In addition, inclement or winter weather may affect access to certain raw materials or impact operations at our facilities. As a result, operating results may vary from quarter to quarter depending on the severity of weather conditions and other variables affecting our products. Historically, our operating results have been significantly lower in the first and fourth calendar quarters as compared to the second and third calendar quarters.

Segment Information

Please see Note 9, “Segment Information,” under Item 8 of this Form 10-K for financial information relating to business segments and geographic areas. See also “Item 1A. Risk Factors – Risks Related to Our Business – Demand for our products is cyclical and we may experience prolonged depressed market conditions for our products.”

Non-U.S. Operations

Koppers has a significant investment in non-U.S. operations. Therefore, we are subject to certain risks that are inherent to foreign operations, including complying with applicable laws relating to foreign practices, the laws of foreign countries in which we operate, political and economic conditions in international markets and fluctuations in foreign exchange rates. See also “Item 1A. Risk Factors – Risks Related to Our Business – We are subject to risks inherent in foreign operations, including additional legal regulation, changes in social, political and economic conditions.”

Environmental Matters

Our operations and properties are subject to extensive federal, state, local and foreign environmental laws and regulations relating to protection of the environment and human health and safety, including those concerning the treatment, storage and disposal of wastes, the investigation and remediation of contaminated soil and groundwater, the discharge of effluents into waterways, the emission of substances into the air, as well as various health and safety matters. Environmental laws and regulations are subject to frequent amendment and have historically become more stringent over time. We have incurred and could incur in the future significant costs if we fail to comply with regulations and responsibilities under environmental laws and regulations, including cleanup costs, civil and criminal penalties, injunctive relief and denial or loss of, or imposition of significant restrictions on, environmental permits. In addition, we have been and could in the future be subject to suit by private parties in connection with alleged violations of, or liabilities under, environmental laws and regulations. Additional information on environmental matters is available in Item 1A under “Risks Related to Our Business” and Note 20 of the Notes to Consolidated Financial Statements, “Commitments and Contingent Liabilities.”

Employees and Employee Relations

As of December 31, 2018, we had 1,028 salaried employees and 1,201 non-salaried employees. Listed below is a breakdown of employees by our businesses, including administration.

Business	Salaried	Non-Salaried	Total
Railroad and Utility Products and Services	378	810	1,188
Performance Chemicals	244	136	380
Carbon Materials and Chemicals	291	244	535
Administration	115	11	126
Total Employees	1,028	1,201	2,229

Approximately 550 of our employees are represented by a number of different labor unions and are covered under numerous labor agreements. The labor contracts at four of our facilities covering approximately 150 employees are scheduled to expire during 2019.

Internet Access

Our Internet address is www.koppers.com. Our recent filings on Form 10-K, 10-Q and 8-K and any amendments to those documents can be accessed without charge on our website under Investor Relations – SEC Filings as soon as reasonably practicable after such filings are made with the Securities and Exchange Commission. The contents of our internet site are not incorporated by reference into this document.

ITEM 1A. RISK FACTORS

You should carefully consider the risks described below before investing in our publicly traded securities. Our business is subject to the risks that affect many other companies, such as competition, technological obsolescence, labor relations, general economic conditions, geopolitical events and international operations.

Risks Related to Our Business

Fluctuations in the price, quality and availability of our primary raw materials could reduce our profitability.

Our operations depend on an adequate supply of quality raw materials being available on a timely basis. The loss of a key source of supply or a delay in shipments could cause a significant increase in our operating expenses. For example, our operations are highly dependent on a relatively small number of freight transportation services. We are also dependent on specialized ocean-going transport vessels that we lease to deliver raw materials to our facilities and finished goods to our customers. Interruptions in such freight services could impair our ability to receive raw materials and ship finished products in a timely manner. We are also exposed to price and quality risks associated with raw material purchases. Such risks include the following:

- The availability and cost of lumber are critical elements in our production of railroad crossties and pole products for our RUPS business. Historically, the supply and cost of hardwood for railroad crossties have been subject to availability and price pressures. We may not be able to obtain wood raw materials at economical prices in the future.
- The availability of scrap copper is a critical element in our production of copper-based wood preservation chemicals for our PC business. Our purchase price for scrap copper is based upon spot prices in the copper market, which may be subject to sudden price changes. We may not be able to obtain scrap copper at prices that match underlying pricing commitments to our customers.
- The primary raw material used by our CMC business is coal tar, a by-product of furnace coke production. Currently, our CMC business supplies our North American RUPS business with 100 percent of its creosote requirements. A shortage in the supply of domestic coal tar or a reduction in the quality of coal tar could require us to increase coal tar or creosote imports to meet future creosote demand. This could cause a significant increase in our operating expenses and we may be unable to pass some or all of these costs on to our customers.
- In certain circumstances coal tar may also be used as an alternative to fuel. In the past, increases in energy prices have resulted in higher coal tar costs which we have attempted to pass through to our customers. If these increased costs cannot be passed through to our customers, it could result in margin reductions for our coal tar-based products.
- Our price realizations and profit margins for phthalic anhydride have historically fluctuated with the price of orthoxylene and its relationship with phthalic anhydride; however, during periods of excess supplies of phthalic anhydride, margins may be reduced despite high levels for orthoxylene prices.
- Our price realizations and profit margins for phthalic anhydride, naphthalene and carbon black feedstock have historically fluctuated with the market price of crude oil, market prices for chemicals derived from crude oil, such as orthoxylene, or market indices derived from crude oil.
- Our profit margins at one of our coal tar distillation facilities has fluctuated with the market price of needle coke.
- We import certain raw materials that are used in our products that are, or may become, subject to tariffs and trade restrictions.

If the costs of raw materials increase significantly and we are unable to offset the increased costs with higher selling prices, our profitability will decline.

We face risks related to our substantial indebtedness.

As of December 31, 2018, we had total outstanding debt of $1,002.6 million, and approximately $179.0 million of additional unused borrowing capacity under our Senior Secured Revolving Credit Facility (the "Revolving Credit Facility"). Our substantial leverage could adversely affect our ability to raise additional capital to fund our operations, limit our ability to react to changes in the economy or our industry, expose us to interest rate risk associated with our variable rate debt and prevent us from meeting our obligations under the Senior Notes due 2025 (the "2025 Notes") and the Revolving Credit Facility as described in Note 16 of the Notes to Consolidated Financial Statements. Our high degree of leverage could have important consequences to us, including:

- making it more difficult for us to make payments on our debt;
- increasing our vulnerability to general economic and industry conditions;
- requiring a substantial portion of cash flow from operations to be dedicated to the payment of principal and interest on our debt, thereby reducing our ability to use our cash flow to fund our operations, capital expenditures, and future business opportunities;
- exposing us to the risk of increased interest rates as certain of our borrowings under our Revolving Credit Facility are at variable rates;
- restricting us from making strategic acquisitions or causing us to make non-strategic divestitures;

- limiting our ability to obtain additional financing for working capital, capital expenditures, product development, debt service requirements, acquisitions, and general corporate or other purposes; and
- limiting our ability to adjust to changing market conditions and placing us at a competitive disadvantage compared to our competitors who may be less highly leveraged.

We and our subsidiaries may be able to incur substantial additional indebtedness in the future, subject to the restrictions contained in our Revolving Credit Facility and the indenture governing the 2025 Notes. If new indebtedness is added to our current debt levels, the related risks that we now face could intensify.

Our debt agreements contain restrictions that limit our flexibility in operating our business.

Our Revolving Credit Facility and the indenture governing the 2025 Notes contain various covenants that limit our ability to engage in specified types of transactions. These covenants limit our ability and the ability of our restricted subsidiaries to, among other things:

- incur additional debt;
- pay dividends or distributions on our capital stock or repurchase our capital stock;
- issue stock of subsidiaries;
- make certain investments;
- create liens on our assets to secure debt;
- enter into transactions with affiliates;
- merge or consolidate with another company; and
- sell or otherwise transfer assets.

In addition, under the Revolving Credit Facility, we are required to meet specified financial ratios in order to undertake certain actions, and we are required to maintain a specified minimum fixed charge coverage ratio and a maximum senior secured leverage ratio. Our ability to meet those tests can be affected by events beyond our control, and we cannot assure you that we will meet them. A breach of any of these covenants could result in a default under our Revolving Credit Facility. Upon the occurrence of an event of default under our Revolving Credit Facility, the lenders could elect to declare all amounts outstanding under our Revolving Credit Facility to be immediately due and payable and terminate all commitments to extend further credit. Such a declaration by the lenders under our Revolving Credit Facility would also constitute an event of default under our 2025 notes. Similarly, a default under our 2025 notes could also constitute an event of default under our Revolving Credit Facility. If we were unable to repay those amounts, the lenders under our Revolving Credit Facility could proceed against the collateral granted to them to secure such indebtedness. We have pledged substantially all of our assets as collateral under our Revolving Credit Facility. If the lenders under our Revolving Credit Facility accelerate the repayment of borrowings, we cannot assure you that we will have sufficient assets to repay our Revolving Credit Facility, as well as our unsecured indebtedness, including notes.

We may not be able to generate sufficient cash to service all of our indebtedness, including the 2025 Notes, and may be forced to take other actions to satisfy our obligations under our indebtedness, which may not be successful.

Our ability to make scheduled payments on or to refinance our debt obligations depends on our financial condition and operating performance, which are subject to prevailing economic and competitive conditions and to certain financial, business and other factors beyond our control. We cannot assure you that we will maintain a level of cash flows from operating activities sufficient to permit us to pay the principal, premium, if any, and interest on our indebtedness, including the 2025 Notes.

If our cash flows and capital resources are insufficient to fund our debt service obligations, we may be forced to reduce or delay investments and capital expenditures, or to sell assets, seek additional capital or restructure or refinance our indebtedness, including the 2025 Notes. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. In the absence of such operating results and resources, we could face substantial liquidity problems and might be required to dispose of material assets or operations to meet our debt service and other obligations. Our Revolving Credit Facility restricts our ability to dispose of assets and use the proceeds from the disposition. We may not be able to consummate those dispositions or to obtain the proceeds that we could realize from them and these proceeds may not be adequate to meet any debt service obligations then due.

The covenants in Koppers Inc.'s Revolving Credit Facility impose restrictions that may limit our ability to take certain actions. Our failure to comply with these covenants could result in the acceleration of our outstanding indebtedness.

Koppers Inc.'s Revolving Credit Facility contains minimum fixed charge coverage, a total leverage ratio, and a maximum senior secured leverage ratio. Additionally, the Revolving Credit Facility includes covenants limiting liens, mergers, asset sales, dividends and the incurrence of debt. Our ability to borrow under Koppers Inc.'s Revolving Credit Facility will depend upon satisfaction of these covenants. Events beyond our control can affect our ability to meet those covenants.

If we are unable to meet the terms of our financial covenants, or if we breach any of these covenants, a default could occur. A default, if not waived, would entitle our lenders to declare all amounts borrowed immediately due and payable, which could also cause the acceleration of obligations under certain other agreements. In the event of acceleration of our outstanding indebtedness, there can be no assurance that we would be able to repay our debt or obtain new financing to refinance our debt. Even if new financing is made available to us, it may not be on terms acceptable to us.

Conditions in the global economy and global capital markets may adversely affect our results of operations, financial condition and cash flows.

In recent history, the U.S. and global economy and capital markets have experienced significant uncertainties and volatility. Our business and operating results can be significantly affected by global economic issues. Our customers may experience deterioration of their business during the adverse business cycles. They may experience cash flow shortages and may have difficulty obtaining financing. As a result, our customers may delay or cancel plans to purchase our products and may not be able to fulfill their payment obligations to us in a timely fashion. Our suppliers may be experiencing similar conditions which could impact their ability to supply us with raw materials and otherwise fulfill their obligations to us. If global economic conditions deteriorate significantly, there could be a material adverse effect to our results of operations, financial condition and cash flows.

In addition, we rely on our Revolving Credit Facility with a consortium of banks to provide us with liquidity to meet our working capital needs. Our ability to fund our liquidity needs and working capital requirements could be impacted in the event that disruptions in the credit markets result in the banks being unable to lend to us under our Revolving Credit Facility.

Global economic issues could prevent us from accurately forecasting demand for our products, which could have a material adverse effect on our results of operations and our financial condition.

Adverse global economic issues, market instability and volatile commodity price fluctuations make it increasingly difficult for us, our customers and our suppliers to accurately forecast future product demands and sales prices, which could cause us to procure raw materials in excess of end-product demand. This could cause a material increase to our inventory carrying costs and, in the event of falling market prices for our end products, result in significant charges to write-down inventory to market prices.

The interest rate of our Revolving Credit Facility is priced using a spread over LIBOR.

LIBOR, the London interbank offered rate, is the basic rate of interest used in lending between banks on the London interbank market and is widely used as a reference for setting the interest rate on loans globally. We typically use LIBOR as a reference rate in our Revolving Credit Facility such that the interest due to our creditors pursuant to our Revolving Credit Facility is calculated using LIBOR. Our Revolving Credit Facility contains a stated minimum value for LIBOR. On July 27, 2017, the United Kingdom’s Financial Conduct Authority, which regulates LIBOR, announced that it intends to phase out LIBOR by the end of 2021. It is unclear if at that time LIBOR will cease to exist or if new methods of calculating LIBOR will be established such that it continues to exist after 2021. The U.S. Federal Reserve, in conjunction with the Alternative Reference Rates Committee, a steering committee comprised of large U.S. financial institutions, is considering replacing U.S. dollar LIBOR with a new index calculated by short-term repurchase agreements, backed by Treasury securities – Secured Overnight Financing Rate (“SOFR”). SOFR is observed and backward looking, which stands in contrast with LIBOR under the current methodology, which is an estimated forward-looking rate and relies, to some degree, on the expert judgment of submitting panel members. Given that SOFR is a secured rate backed by government securities, it will be a rate that does not take into account bank credit risk (as is the case with LIBOR). SOFR is therefore likely to be lower than LIBOR and is less likely to correlate with the funding costs of financial institutions. Whether or not SOFR attains market traction as a LIBOR replacement tool remains in question. As such, the future of LIBOR at this time is uncertain. If LIBOR ceases to exist, we may need to renegotiate our credit agreements that utilize LIBOR as a factor in determining the interest rate to replace LIBOR with the new standard that is established.

Intellectual property rights are important to our business. If our patents are declared invalid or our trade secrets become known to our competitors, our ability to compete may be adversely affected.

Proprietary protection of our processes, apparatuses and other technology is important to our business, particularly in our PC business. Consequently, we may have to rely on judicial enforcement of our patents and other proprietary rights, which is generally a time consuming and expensive process. While a presumption of validity exists with respect to patents issued to us in the U.S., there can be no assurance that any of our patents will not be challenged, invalidated, circumvented or rendered unenforceable. Furthermore, if any pending patent application filed by us does not result in an issued patent, or if patents are issued to us, but such patents do not provide meaningful protection of our intellectual property, or if patents issued to us expire, then our ability to compete may be adversely affected. Additionally, our competitors or other third parties may obtain patents that restrict or preclude our ability to lawfully produce or sell our products in a competitive manner, which could have a material adverse effect on our business, cash flow and financial condition. The growth of our business also depends on our ability to develop new intellectual property rights, including patents, and the successful implementation of innovation initiatives. There can be no assurance that our efforts to do so will be successful and the failure to do so could negatively impact our results of operations.

We also rely upon unpatented proprietary know-how and continuing technological innovation and other trade secrets to develop and maintain our competitive position, particularly in our PC business. While it is our practice to enter into confidentiality agreements with our employees and third parties to protect our intellectual property, these confidentiality agreements may be breached or may not provide meaningful protection for our trade secrets or proprietary know-how, and adequate remedies may not be available in the event of an unauthorized use or disclosure of our trade secrets and know-how. In addition, others could obtain knowledge of our trade secrets through independent development or other access by legal means. The failure of our patents or confidentiality agreements to protect our processes, apparatuses, technology, trade secrets or proprietary know-how could have a material adverse effect on our business, cash flow and financial condition.

We may be required to recognize impairment charges for our long-lived assets.

At December 31, 2018, the net carrying value of long-lived assets (property, plant and equipment, goodwill and other intangible assets) totaled $902.4 million. In accordance with generally accepted accounting principles, we periodically assess these assets to determine if they are impaired. In the past four years, we have recognized a total of $21.9 million of fixed asset impairment charges at various CMC coal tar distillation facilities and RUPS wood treating plants. In 2015 we recognized a goodwill impairment charge of $67.2 million related to our CMC business segment. Significant negative industry or economic trends, disruptions to our business, unexpected significant changes or planned changes in use of the assets, divestitures and market capitalization declines may result in impairments to goodwill and other long-lived assets. Future impairment charges could significantly affect our results of operations in the periods recognized. Impairment charges would also reduce our shareholders' equity and could affect compliance with the covenants in our debt agreements.

We may not be able to compete successfully in any or all of the industry segments in which we operate.

The markets in which we operate are highly competitive, and this competition could harm our business, results of operations, cash flow and financial condition. If we are unable to respond successfully to changing competitive conditions, the demand for our products could be affected. We believe that the most significant competitive factor for our products is selling price. Some of our competitors have greater financial resources and larger capitalization than we do and, as a result, they may be better positioned to compete in a declining market.

Demand for our products is cyclical and we may experience prolonged depressed market conditions for our products.

Our products are sold primarily into markets which historically have been cyclical, such as wood preservation, aluminum and specialty chemicals.

The principal use of our wood preservation chemicals is in the manufacture of treated lumber, which is used mainly for residential applications, such as wood decking, and also industrial applications, such as the treating of railroad crossties and utility poles. Therefore, a decline in remodeling and construction could reduce demand for wood preservation chemicals for residential applications and a decline in the capital spending requirements for railroads and utility companies could reduce demand for wood preservation chemicals for industrial applications.

The principal consumers of our carbon pitch are primary aluminum smelters. Although the global aluminum industry has experienced growth on a long-term basis, the aluminum industry has experienced a shift in primary aluminum production from the mature geographies where we have historically enjoyed high market shares into emerging economies.

The principal use of our phthalic anhydride is in the manufacture of plasticizers and flexible vinyl, which are used mainly in the housing and automobile industries. Therefore, a decline in remodeling and construction or global automobile production could reduce the demand for phthalic anhydride.

We are dependent on major customers for a significant portion of our net sales, and the loss of one or more of our major customers could result in a significant reduction in our profitability as a whole or the profitability of a particular product.

Although no one customer accounted for more than five percent of our net sales for the year ended December 31, 2018, our top ten customers accounted for approximately 34 percent of our net sales. The loss of a significant customer could have a material adverse effect on our business, cash flow and financial condition.

Our products may be rendered obsolete or less attractive by changes in regulatory, legislative or industry requirements.

Changes in regulatory, legislative or industry requirements may render certain of our products obsolete or less attractive. Our ability to anticipate changes in these requirements, especially changes in regulatory standards, will be a significant factor in our ability to remain competitive. We may not be able to comply in the future with new regulatory, legislative and/or industrial standards that may be necessary for us to remain competitive and certain of our products may, as a result, become obsolete or less attractive to our customers.

The development of new technologies or changes in our customers' products could reduce the demand for our products.

Our products are used for a variety of applications by our customers. Changes in our customers' products or processes may enable our customers to reduce consumption of the products we produce or make our products unnecessary. Customers may also find alternative materials or processes that no longer require our products.

As a producer of wood preservatives, we may incur additional costs under our warranties or otherwise for claims related to treated-wood products.

We provide limited warranties on certain treated-wood products. These limited warranties cover treated-wood products that are produced by certain of our customers who use wood preservatives supplied by us. The limited warranties generally provide for replacement of properly treated-wood (treated-wood only) or refund of the purchase price for the treated-wood product that prematurely fails due to fungal decay or termite attack. From time to time, we (or our customers) receive claims under these warranties or other claims relating to alleged failures of treated-wood products. Our profitability could be adversely affected if the amount of warranty claims against us or our customers significantly increase.

Hazards associated with chemical manufacturing may cause suspensions or interruptions of our operations.

Due to the nature of our business, we are exposed to the hazards associated with chemical manufacturing and the related use, storage and transportation of raw materials, products and wastes in our manufacturing facilities and our distribution centers, such as fires, explosions and accidents that could lead to a suspension or interruption of operations. Any disruption could reduce the productivity and profitability of a particular manufacturing facility or of our company as a whole. Other hazards include the following:

- piping and storage tank leaks and ruptures;
- mechanical failure;
- exposure to hazardous substances; and
- chemical spills and other discharges or releases of toxic or hazardous wastes, substances or gases.

These hazards, among others, may cause personal injury and loss of life, damage to property and contamination of the environment, which could lead to government fines or work stoppage injunctions, cleanup costs and lawsuits by injured persons. While we are unable to predict the outcome of such matters, if determined adversely to us, we may not have adequate insurance to cover related costs or liabilities and, if not, we may not have sufficient cash flow to pay for such costs or liabilities. Such outcomes could harm our customer goodwill and reduce our profitability and could have a material adverse effect on our business, financial condition, cash flow and results from operations.

We are subject to extensive environmental laws and regulations and may incur significant costs as a result of continued compliance with, violations of or liabilities under environmental laws and regulations.

Like other companies involved in environmentally sensitive businesses, our operations and properties are subject to extensive federal, state, local and foreign environmental laws and regulations, including those concerning the following, among other things:

- the treatment, storage and disposal of wastes;
- the investigation and remediation of contaminated soil and groundwater;
- the discharge of effluents into waterways;
- the emission of substances into the air;
- the marketing, sale, use and registration of our chemical products, such as creosote and MicroPro ®;
- the European Union's regulation under the Registration Evaluation Authorization and Restriction of Chemicals, which requires manufacturers or importers of substances manufactured or imported into the European Union in quantities of one tonne per year or more to register with a central European Chemicals Agency;

the European Union’s regulation under the Biocidal Products Regulation, which requires a biocidal product to be authorized by the European Chemicals Agency before it can be marketed or used in the European Union; and
other matters relating to environmental protection and various health and safety matters.

We have incurred, and expect to continue to incur, significant costs to comply with environmental laws and regulations and as a result of remedial obligations. We could incur significant costs, including cleanup costs, fines, civil and criminal sanctions and claims by third parties for property damage and personal injury, as a result of violations of or liabilities under environmental laws and regulations. We accrue for environmental liabilities when a determination can be made that they are probable and reasonably estimable. Total environmental reserves at December 31, 2018 were $10.1 million, which include provisions primarily for environmental remediation. In addition, we incur significant annual operating expenses related to environmental matters and significant capital expenditures related to environmental control facilities. Capital expenditures related to environmental control facilities in 2019 are expected to total approximately $9.1 million, funded by operations. Contamination has been identified and is being investigated and remediated at many of our sites by us or other parties. We believe that we will have continuing significant expenditures associated with compliance with environmental laws and regulations and, to the extent not covered by insurance or available recoveries under third-party indemnification arrangements, for present and future remediation efforts at plant sites and third-party waste sites and other liabilities associated with environmental matters. There can be no assurance that these expenditures will not exceed current estimates and will not have a material adverse effect on our business, financial condition, cash flow and results of operations.

Actual costs and liabilities to us may exceed forecasted amounts. Moreover, currently unknown environmental issues, such as the discovery of additional contamination or the imposition of additional sampling or cleanup obligations with respect to our sites or third-party sites, may result in significant additional costs, and potentially significant expenditures could be required in order to comply with future changes to environmental laws and regulations or the interpretation or enforcement thereof. We also are involved in various litigation and proceedings relating to environmental matters and toxic tort claims.

Changes in applicable tax regulations and resolutions of tax disputes could negatively affect our financial results.

We are subject to income tax laws and regulations in the United States and various foreign jurisdictions. Significant judgment is required in evaluating and estimating our provision and accruals for these taxes. Our income tax liabilities are dependent upon the location of earnings among these different jurisdictions. Our income tax provision and income tax liabilities could be adversely affected by the jurisdictional mix of earnings, changes in valuation of deferred tax assets and liabilities and changes in tax laws and regulations. In the ordinary course of our business, we are also subject to continuous examinations of our income tax returns by tax authorities. Although we believe our tax estimates are reasonable, the final results of any tax examination or related litigation could be materially different from our related historical income tax provisions and accruals. Adverse developments in an audit, examination or litigation related to previously filed tax returns, or in the relevant jurisdiction’s tax laws, regulations, administrative practices, principles and interpretations could have a material effect on our results of operations and cash flows in the period or periods for which that development occurs, as well as for prior and subsequent periods.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the “Tax Act”). Since the passing of the Tax Act, additional guidance in the form of notices and proposed regulations which interpret various aspects of the Tax Act have been issued. As of the filing of this document, additional guidance is expected. Changes could be made to the proposed regulations as they become finalized, future legislation could be enacted, more regulations and notices could be issued, all of which may impact our financial results. We will continue to monitor all of these changes and will reflect the impact as appropriate in future financial statements. Many state and local tax jurisdictions are still determining how they will interpret elements of the Tax Act. Final state and local governments' conformity, legislation and guidance relating to the Tax Act may have a material adverse effect on our cash flow and results of operations.

Future climate change regulation could result in increased operating costs and reduced demand for our products.

Although the United States has not ratified the Kyoto Protocol, a number of federal laws related to "greenhouse gas," or "GHG," emissions have been considered by Congress. Additionally, various federal, state and regional regulations and initiatives have been enacted or are being considered.

Member States of the European Union each have an overall cap on emissions which are approved by the European Commission and implement the European Union Emissions Trading Directive as a commitment to the Kyoto Protocol. Under this Directive, organizations apply to the Member State for an allowance of GHG emissions. These allowances are tradable so as to enable companies that manage to reduce their GHG emissions to sell their excess allowances to companies that are not reaching their emissions objectives. Failure to purchase sufficient allowances will require the purchase of allowances at a current market price.

Any laws or regulations that may be adopted to restrict or reduce emissions of GHGs could cause an increase to our raw material costs, could require us to incur increased operating costs and could have an adverse effect on demand for our products.

Beazer East and Beazer Limited may not continue to meet their obligations to indemnify us.

Under the terms of the asset purchase agreement between us and Koppers Company, Inc. (now known as Beazer East, Inc.) upon the formation of Koppers Inc. in 1988, subject to certain limitations, Beazer East and Beazer Limited assumed the liability for and indemnified us against, among other things, certain clean-up liabilities for contamination occurring prior to the purchase date at sites acquired from Beazer East and certain third-party claims arising from such contamination (the “Indemnity”). Beazer East and Beazer Limited (which are indirect subsidiaries of Heidelberg Cement AG) may not continue to meet their obligations. Beazer East could in the future choose to challenge its obligations under the Indemnity or our satisfaction of the conditions to indemnification imposed on us thereunder. The government and other third parties may have the right under applicable environmental laws to seek relief directly from us for any and all such costs and liabilities. In July 2004, we entered into an agreement with Beazer East to amend the December 29, 1988 asset purchase agreement to provide, among other things, for the continued tender of pre-closing environmental liabilities to Beazer East under the Indemnity through July 2019. As consideration for the agreement, we, among other things, paid Beazer East $7.0 million and agreed to share toxic tort litigation defense costs arising from sites acquired from Beazer East. Qualified expenditures under the Indemnity are not subject to a monetary limit.

The Indemnity provides for the resolution of issues between Koppers Inc. and Beazer East by an arbitrator on an expedited basis upon the request of either party. The arbitrator could be asked, among other things, to make a determination regarding the allocation of environmental responsibilities between Koppers Inc. and Beazer East. Arbitration decisions under the Indemnity are final and binding on the parties. Periodically, issues have arisen between Koppers Inc. and Beazer East and/or other indemnitors that have been resolved without arbitration. From time to time, Koppers Inc. and Beazer East have engaged in discussions that involve, among other things, the allocation of environmental costs related to certain operating and closed facilities.

Without reimbursement under the Indemnity, the obligation to pay the costs and assume the liabilities relating to these matters would have a significant impact on our net income. Furthermore, without reimbursement, we could be required to record a contingent liability on our balance sheet with respect to environmental matters covered by the Indemnity, which could result in our having significant negative net worth. Finally, the Indemnity does not afford us indemnification against environmental costs and liabilities attributable to acts or omissions occurring after the closing of the acquisition of assets from Beazer East under the asset purchase agreement, nor is the Indemnity applicable to liabilities arising in connection with other acquisitions by us after that closing.

The insurance that we maintain may not fully cover all potential exposures.

We maintain property, casualty, general liability, workers’ compensation, pollution legal liability and other insurance, but such insurance may not cover all risks associated with the hazards of our business and is subject to limitations, including deductibles and maximum limits. We may incur losses beyond the limits, or outside the coverage, of our insurance policies, including liabilities for environmental compliance and remediation. In addition, from time to time, various types of insurance for companies in our industry have not been available on commercially acceptable terms or, in some cases, have not been available at all. In the future, we may not be able to obtain coverage at current levels, and our premiums may increase significantly on coverage that we maintain.

Adverse weather conditions may reduce our operating results.

Our quarterly operating results fluctuate due to a variety of factors that are outside our control, including inclement weather conditions, which in the past have caused a decline in our operating results. For example, adverse weather conditions have at times negatively impacted our supply chain as wet conditions impacted logging operations, reducing our ability to procure crossties. In addition, adverse weather conditions have had a negative impact on our customers in our pavement sealer and wood preservation businesses, resulting in a negative impact on our sales of these products. Moreover, demand for many of our products declines during periods of inclement weather.

We are subject to risks inherent in foreign operations, including additional legal regulation, changes in social, political and economic conditions.

We have operations in the United States, Australia, Denmark, the United Kingdom, New Zealand, China and Canada, among others, and sell our products in many foreign countries. For the year ended December 31, 2018, net sales from products sold by our foreign subsidiaries accounted for approximately 40 percent of our total net sales.

Doing business on a global basis requires us to comply with the laws and regulations of the U.S. government and various international jurisdictions. These regulations place restrictions on our operations, trade practices and partners and investment decisions. In particular, our international operations are subject to U.S. and foreign anti-corruption laws and regulations, such as the Foreign Corrupt Practices Act, and economic sanction programs administered by the U.S. Treasury Department's Office of Foreign Assets Control. Violations of these laws and regulations may result in civil or criminal penalties, including fines.

For example, some of our operations are subject to the European Union's General Data Protection Regulation ("GDPR"), which became effective in May 2018. The GDPR creates a range of new compliance obligations for companies that process personal data of European Union residents and increases financial penalties for non-compliance. We process personal data of our employees who are European Union residents and will continue dedicating financial resources and management time to GDPR compliance. We bear the cost of compliance with the GDPR and are subject to fines and penalties in the event of a breach of the GDPR, which could have an adverse impact on our business, financial condition or results of operations.

Political and financial instability can lead to economic uncertainty and may adversely impact our business. For example, the announcement of the Referendum of the United Kingdom's (the "U.K.") Membership of the European Union ("E.U.") (referred to as "Brexit"), advising for the exit of the U.K. from the E.U., resulted in significant volatility in global stock markets and currency exchange rate fluctuations. If customers' buying patterns, decision-making processes, timing of expected deliveries and timing of new projects unfavorably change due to economic or political conditions, there would be a material adverse effect on our business, financial condition and operating results.

In addition, as a global business, we are also exposed to market risks relating to fluctuations in interest rates and foreign currency exchange rates. Our international revenues could be reduced by currency fluctuations or devaluations. Changes in currency exchange rates could lower our reported revenues and could require us to reduce our prices to remain competitive in foreign markets, which could also reduce our profitability. We have not historically hedged our financial statement exposure and, as a result, we could incur unanticipated losses. We are also subject to potentially increasing transportation and shipping costs associated with international operations. Furthermore, we are also exposed to risks associated with changes in the laws and policies governing foreign investments in countries where we have operations as well as, to a lesser extent, changes in U.S. laws and regulations relating to foreign trade and investment.

Our strategy to selectively pursue complementary acquisitions may present unforeseen integration obstacles or costs.

Our business strategy includes the potential acquisition of businesses and entering into joint ventures and other business combinations that we expect would complement and expand our existing products and the markets where we sell our products. We may not be able to successfully identify suitable acquisition or joint venture opportunities or complete any particular acquisition, combination, joint venture or other transaction on acceptable terms. We cannot predict the timing and success of our efforts to acquire any particular business. Also, efforts to acquire other businesses or the implementation of other elements of this business strategy may divert managerial resources away from our business operations. In addition, our ability to engage in strategic acquisitions may depend on our ability to raise substantial capital and we may not be able to raise the funds necessary to implement our acquisition strategy on terms satisfactory to us, if at all. Our failure to identify suitable acquisition or joint venture opportunities may restrict our ability to grow our business. In addition, we may not be able to successfully integrate businesses that we acquire in the future or have recently acquired, which could lead to increased operating costs, a failure to realize anticipated operating synergies, or both.

Litigation against us could be costly and time-consuming to defend, and due to the nature of our business and products, we may be liable for damages arising out of our acts or omissions, which may have a material adverse effect on us.

We are a defendant in a significant number of lawsuits in which the plaintiffs claim they have suffered a variety of illnesses (including cancer) and/or property damage as a result of exposure to coal tar pitch, pavement sealer, benzene, wood treatment chemicals and other chemicals. In addition, we are regularly subject to legal proceedings and claims that arise in the ordinary course of business, such as workers' compensation claims, governmental investigations, employment disputes, and customer and supplier disputes arising out of the conduct of our business. We also are involved in various litigation and proceedings relating to environmental matters. Litigation could result in substantial costs and may divert management's attention and resources away from the day-to-day operation of our business.

We are indemnified for certain product liability exposures under the Indemnity with Beazer East related to products sold prior to the closing of the acquisition of assets from Beazer East. Beazer East and Beazer Limited may not continue to meet their indemnification obligations. In addition, Beazer East could choose to challenge its indemnification obligations or our satisfaction of the conditions to indemnification imposed on us thereunder. If for any reason (including disputed coverage or financial incapability) one or more of such parties fail to perform their obligations and we are held liable for or otherwise required to pay all or part of such liabilities without reimbursement, the imposition of such liabilities on us could have a material adverse effect on our business, financial condition, cash flows and results of operations. Furthermore, we could be required to record a contingent liability on our balance sheet with respect to such matters, which could result in us having significant negative net worth.

Labor disputes could disrupt our operations and divert the attention of our management and may cause a decline in our production and a reduction in our profitability.

Many of our employees are represented by a number of different labor unions and are covered under numerous labor agreements. Typically, a number of our labor agreements are scheduled to expire each year. We may not be able to reach new agreements without union action or on terms satisfactory to us. Any future labor disputes with any such unions could result in strikes or other labor protests, which could disrupt our operations and divert the attention of our management from operating our business. If we were to experience a strike or work stoppage, it may be difficult for us to find a sufficient number of employees with the necessary skills to replace these employees. Any such labor disputes could cause a decline in our production and a reduction in our profitability.

Our post-retirement obligations are currently underfunded. We may be required to make significant cash payments to our pension and other post-retirement plans, which will reduce the cash available for our business.

As of December 31, 2018, our benefit obligation under our defined benefit pension plans exceeded the fair value of plan assets by $32.1 million. Our pension asset funding to total pension obligation ratio was 72 percent as of December 31, 2018. The underfunding was caused, in large part, by fluctuations in the financial markets that have caused the value of the assets in our defined benefit pension plans to be significantly lower than anticipated and by fluctuations in interest rates which increased the discounted pension liabilities. In addition, our obligations for other post-retirement benefit obligations are unfunded and total $9.4 million at December 31, 2018.

During the years ended December 31, 2018 and December 31, 2017, we contributed $4.7 million and $12.1 million, respectively, to our post-retirement benefit plans. Management expects that any future obligations under our post-retirement benefit plans that are not currently funded will be funded from our future cash flow from operations. If our contributions to our post-retirement benefit plans are insufficient to fund the post-retirement benefit plans adequately to cover our future obligations, the performance of the assets in our pension plans does not meet our expectations or other actuarial assumptions or mandatory funding laws are modified, our contributions to our post-retirement benefit plans could be materially higher than we expect, thus reducing the cash available for our business.

We may incur significant charges in the event we close all or part of a manufacturing plant or facility.

We periodically assess our manufacturing operations in order to manufacture and distribute our products in the most efficient manner. Based on our assessments, we may make capital improvements to modernize certain units, move manufacturing or distribution capabilities from one plant or facility to another plant or facility, discontinue manufacturing or distributing certain products or close all or part of a manufacturing plant or facility, any of which could cause us to incur significant charges. The actual costs to close a manufacturing facility may exceed our original cost estimate and may have a material adverse effect on our financial condition, cash flow from operations and results from operations.

We depend on our senior management team and other key employees and the loss of these employees could adversely affect our business.

Our success is dependent on the management, experience and leadership skills of our senior management team and key employees. The loss of any of these individuals or an inability to attract, retain and maintain additional personnel with similar industry experience could prevent us from implementing our business strategy. We cannot assure you that we will be able to retain our existing senior management and key personnel or to attract additional qualified personnel when needed. Senior management or key personnel may retire from time to time, and our employment agreements with these individuals may expire from time to time.

We may be subject to information technology systems failures, network disruptions and breaches of data security, which could harm our relationships with our customers and third-party business partners, subject us to negative publicity and litigation and cause substantial harm to our business.

We depend on integrated information systems to conduct our business. Information technology systems failures, including risks associated with upgrading our systems or in successfully integrating information technology and other systems in connection with the integration of businesses we acquire, network disruptions and breaches of data security could disrupt our operations by impeding our processing of transactions, our ability to protect customer or company information and our financial reporting. Our computer systems, including our back-up systems, could be damaged or interrupted by power outages, computer and telecommunications failures, computer viruses, internal or external security breaches, events such as fires, earthquakes, floods, tornadoes and hurricanes, and/or errors by our employees.

We have been subject to cyberattacks in the past, including phishing and malware incidents, and although no such attack has had a material adverse effect on our business, this may not be the case with future attacks. As the prevalence of cyberattacks continues to increase, our information technology systems may be subject to increased security threats and we may incur additional costs to upgrade and maintain our security measures in place to prevent and detect such threats. The security and privacy measures that our vendors and customers implement may not be sufficient to prevent and detect cyberattacks that could have a material adverse effect on our financial condition, results of operations and cash flows. While our vendor agreements typically contain provisions that seek to eliminate or limit our exposure to liability for damages from a cyberattack, we cannot assure that such provisions will withstand legal challenges or cover all or any such damages.

In addition, outside parties may attempt to fraudulently induce employees or customers to disclose access credentials or other sensitive information in order to gain access to our systems and networks. We also may be subject to additional vulnerabilities as we integrate the systems, computers, software and data of acquired businesses and third-party business partners into our networks and separate the systems, computers, software and data of disposed businesses from our networks.

There are no assurances that our security measures, our business continuity and disaster recovery plans or actions and investments to improve the maturity of our systems, processes and risk management framework or remediate vulnerabilities will be sufficient or completed quickly enough to prevent or detect, or limit the impact of, cyberattacks or security breaches, and any such breaches could result in transactional errors, business disruptions, loss of or damage to intellectual property, loss of customers and business opportunities, unauthorized access to or disclosure of confidential or personal information, regulatory fines, penalties or litigation, reputational damage, reimbursement or other compensatory costs, and additional compliance costs, any of which could have a material adverse effect on our financial condition, results of operations and cash flows.

Risks Related to Our Common Stock

Our stock price may be extremely volatile.

There has been significant volatility in the market price and trading volume of equity securities, which is unrelated to the financial performance of the companies issuing the securities. These types of broad market fluctuations may negatively affect the market price of our common stock.

Some specific factors that may have a significant effect on our common stock market price include the following:

- actual or anticipated fluctuations in our operating results or future prospects;
- the public’s reaction to our press releases, our other public announcements and our filings with the Securities and Exchange Commission, (the “SEC”);
- strategic actions by us or our competitors, such as acquisitions or restructurings;
- new laws or regulations or new interpretations of existing laws or regulations applicable to our business;
- changes in accounting standards, policies, guidance, interpretations or principles;
- adverse conditions in the financial markets or general economic conditions, including those resulting from war, incidents of terrorism and responses to such events;

- sales of common stock by us, members of our management team or a significant shareholder;
- changes in stock market analyst recommendations or earnings estimates regarding our common stock or other comparable companies; and
- changes in our current dividend policy.

We cannot predict the extent to which investor interest in our company will continue to support an active trading market for our common stock on the New York Stock Exchange (the “NYSE”) or otherwise or how liquid that market will continue to be. If there does not continue to be an active trading market for our common stock, you may have difficulty selling any of our common stock that you buy.

Future sales, or the perception of future sales, of a substantial amount of our common stock may depress the price of the shares of our common stock.

Future sales, or the perception or the availability for sale in the public market, of substantial amounts of our common stock could adversely affect the prevailing market price of our common stock and could impair our ability to raise capital through future sales of equity securities at a time and price that we deem appropriate.

We may issue shares of our common stock, or other securities, from time to time as consideration for future acquisitions and investments. We may also issue shares of our common stock, or other securities, in connection with employee stock compensation programs, employee stock purchase programs and board of directors' compensation. In addition, we may issue shares of our common stock or other securities in public or private offerings as part of our efforts to raise additional capital. In the event any such acquisition, investment, issuance under stock compensation programs or offering is significant, the number of shares of our common stock or the number or aggregate principal amount, as the case may be, of other securities that we may issue may in turn be significant. We may also grant registration rights covering those shares or other securities in connection with any such acquisitions and investments. Any additional capital raised through the sale of our equity securities may dilute your percentage ownership in us.

We have not declared a dividend since November 2014.

We are not required to pay dividends, and our shareholders are not guaranteed, and do not have contractual rights, to receive dividends. Our board of directors may decide at any time, in its discretion, to change or revoke our dividend policy. We currently intend to use the annual cash savings from such dividend suspension to preserve financial flexibility while funding our strategic growth initiatives and debt repayments. Any determination to pay dividends in the future will be at the discretion of our board of directors and will depend upon results of operations, financial condition, contractual restrictions, restrictions imposed by applicable law and other factors our board of directors deems relevant.

The ability of Koppers Inc. and its subsidiaries to pay dividends or make other payments or distributions to us will depend on our operating results and may be restricted by, among other things, the covenants in Koppers Inc.'s Revolving Credit Facility. Our ability to pay dividends is also limited by the indenture governing the 2025 Notes as well as Pennsylvania law and may in the future be limited by the covenants of any future outstanding indebtedness we or our subsidiaries incur. If a dividend is paid in violation of Pennsylvania law, each director approving the dividend could be liable to the corporation if the director did not act with such care as a person of ordinary prudence would use under similar circumstances. Directors are entitled to rely in good faith on information provided by employees of the corporation and experts retained by the corporation. Directors who are held liable would be entitled to contribution from any shareholders who received an unlawful dividend knowing it to be unlawful. Furthermore, we are a holding company with no operations, and unless we receive dividends, distributions, advances, transfers of funds or other payments from our subsidiaries, we will be unable to pay dividends on our common stock.

Provisions of our charter documents may inhibit a takeover, which could negatively affect our stock price.

Provisions of our charter documents and the Business Corporation Law of Pennsylvania, the state in which we are incorporated, could discourage potential acquisition proposals or make it more difficult for a third party to acquire control of our company, even if doing so might be beneficial to our shareholders. Our Amended and Restated Articles of Incorporation (our "Articles of Incorporation") and our Second Amended and Restated Bylaws (our "Bylaws") provide for various procedural and other requirements that could make it more difficult for shareholders to effect certain corporate actions. For example, our Articles of Incorporation authorize our board of directors to determine the rights, preferences, privileges and restrictions of unissued series of preferred stock without any vote or action by our shareholders. Our board of directors can therefore authorize and issue shares of preferred stock with voting or conversion rights that could adversely affect the voting or other rights of holders of our common stock. The following additional provisions could make it more difficult for shareholders to effect certain corporate actions:

- Our shareholders will be able to remove directors only for cause by the affirmative vote of the holders of a majority of the outstanding shares of our capital stock entitled to vote in the election of directors. Vacancies on our board of directors may be filled only by our board of directors.
- Under Pennsylvania law, cumulative voting rights are available to the holders of our common stock if our Articles of Incorporation have not negated cumulative voting. Our Articles of Incorporation provide that our shareholders do not have the right to cumulative votes in the election of directors.

Our Articles of Incorporation do not permit shareholder action without a meeting by consent except for the unanimous consent of all holders of our common stock. The Articles of Incorporation also provide that special meetings of our shareholders may be called only by the board of directors or the chairman of the board of directors. Our Bylaws provide that shareholders seeking to nominate candidates for election as directors or to bring business before an annual meeting of shareholders must provide timely notice of their proposal in writing to the corporate secretary.

These provisions may discourage acquisition proposals and may make it more difficult or expensive for a third party to acquire a majority of our outstanding voting stock or may delay, prevent or deter a merger, acquisition, tender offer or proxy contest, which may negatively affect our stock price.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

The following chart sets forth information regarding our production facilities. Generally, our production and port facilities are suitable and adequate for the purposes for which they are intended and overall have sufficient capacity to conduct business in the upcoming year.

Primary Product Line	Location	Description of Property Interest
Railroad and Utility Products and Services		
Utility poles	Arbuckle, California	Leased
Railroad crossties	Ashcroft, British Columbia, Canada	Owned
Utility poles	Blackstone, Virginia	Owned
Utility poles	Bunbury, Western Australia, Australia	Owned/Leased
Railroad crossties	Denver, Colorado	Owned
Utility poles	Eutawville, South Carolina	Owned
Railroad crossties	Florence, South Carolina	Owned
Railroad crossties	Galesburg, Illinois	Leased
Utility poles	Grafton, New South Wales, Australia	Owned
Railroad crossties	Guthrie, Kentucky	Owned
Rail joint bars	Huntington, West Virginia	Leased
Utility poles	Jasper, Texas	Leased
Railroad crosstie materials recovery	L'Anse, Michigan	Leased
Utility poles	Leland, North Carolina	Owned
Utility poles	Longford, Tasmania, Australia	Owned
Railroad structures	Madison, Wisconsin	Owned
Railroad crossties	Muncy, Pennsylvania	Owned
Utility poles	Newsoms, Virginia	Owned
Utility poles	North, South Carolina	Owned
Railroad crossties	North Little Rock, Arkansas	Owned
Railroad crosstie materials recovery	Orange, Texas	Leased
Railroad crosstie materials recovery	Queen City, Texas	Leased
Railroad crossties	Roanoke, Virginia	Owned
Railroad crossties	Somerville, Texas	Owned
Utility poles	Sweetwater, Tennessee	Owned
Pine products	Takura, Queensland, Australia	Leased
Utility poles	Vance, Alabama	Leased
Utility poles	Vidalia, Georgia	Owned
Performance Chemicals		
Wood preservation chemicals	Auckland, New Zealand	Owned
Wood preservation chemicals	Christchurch, New Zealand	Owned
Wood preservation chemicals	Darlington, United Kingdom	Owned
Wood preservation chemicals	Geelong, Victoria, Australia	Owned
Intermediate copper products	Hubbell, Michigan	Leased

Wood preservation chemicals	Millington, Tennessee	Owned
Wood preservation chemicals	Mt. Gambier, South Australia, Australia	Owned
Wood preservation chemicals	Rock Hill, South Carolina	Owned
Carbon Materials and Chemicals		
Coal tar chemicals	Follansbee, West Virginia	Owned
Carbon products	Mayfield, New South Wales, Australia	Owned
Carbon products	Nyborg, Denmark	Owned/Leased
Carbon products	Pizhou, Jiangsu Province, China	Leased
Carbon products, phthalic anhydride	Stickney, Illinois	Owned

Our corporate offices are located in leased office space in Pittsburgh, Pennsylvania. The lease term expires on December 31, 2028. We also own office space in Griffin, Georgia.

ITEM 3. LEGAL PROCEEDINGS

We are involved in litigation and other proceedings relating to environmental laws and regulations, toxic tort, product liability and other matters. An adverse outcome for certain of these cases could result in a material adverse effect on our business, cash flows and results of operations. The information related to legal matters set forth in Note 20 to the Consolidated Financial Statements of Koppers Holdings Inc. is hereby incorporated by reference.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

EXECUTIVE OFFICERS OF THE REGISTRANT

The following table sets forth the names, ages and positions of our and Koppers Inc.'s executive officers as of March 1, 2019. Our executive officers hold their positions until the annual meeting of the board of directors or until their respective successors are elected and qualified.

Name	Age	Position
Leroy M. Ball	50	President, Chief Executive Officer, and Director of Koppers Holdings Inc. and Koppers Inc.
Joseph P. Dowd	58	Global Vice President, Safety, Health, Environmental and Process Excellence, Koppers Inc.
Douglas J. Fenwick	53	Vice President, Performance Chemicals, Koppers Inc.
Leslie S. Hyde	58	Vice President, Corporate Strategy and Risk Management, Koppers Inc.
R. Michael Johnson	46	Vice President, Koppers Utility and Industrial Products, Koppers Inc.
Steven R. Lacy	63	Chief Administrative Officer, General Counsel and Secretary, Koppers Holdings Inc. and Koppers Inc., and Director of Koppers Inc.
James A. Sullivan	55	Senior Vice President, Railroad Products and Services and Global Carbon Materials and Chemicals, Koppers Inc.
Michael J. Zugay	67	Chief Financial Officer and Treasurer, Koppers Holdings Inc. and Koppers Inc., and Director of Koppers Inc.

Mr. Ball has served as President and Chief Executive Officer of Koppers Holdings Inc. and Koppers Inc. since January 2015. From May 2014 through December 2014, Mr. Ball served as Chief Operating Officer of Koppers Holdings Inc. and Koppers Inc. From May 2014 until August 2014, Mr. Ball served as both Chief Operating Officer and Chief Financial Officer of Koppers Holdings Inc. and Koppers Inc. He served as Vice President and Chief Financial Officer of Koppers Holdings Inc. and Koppers Inc. from September 2010 to May 2014. Mr. Ball has served as a Director of Koppers Holdings Inc. since February 2015 and as a Director of Koppers Inc. since May 2013.

Mr. Dowd has served as Global Vice President of Safety, Health, Environmental, and Process Excellence, Koppers Inc. since January 2016. From July 2012 to December 2015, Mr. Dowd served as Vice President, North American Carbon Materials and Chemicals, Koppers Inc.

Mr. Fenwick has served as Vice President, Performance Chemicals, Koppers Inc. since May 2017. Mr. Fenwick has also served as Vice President of Koppers Performance Chemicals Inc. (formerly known as Osmose, Inc.) from our acquisition of Osmose, Inc. in August 2014. Also, prior to our acquisition of Osmose, Inc., Mr. Fenwick served as Vice President, Customer Services for Osmose, Inc. since May 2011.

Ms. Hyde has served as Vice President, Corporate Strategy and Risk Management since November 2017. From January 2016 to October 2017, Ms. Hyde served as Vice President, Risk Management and Deputy General Counsel of Koppers Inc. From January 2005 to December 2015, Ms. Hyde served as Vice President, Safety and Environmental Affairs of Koppers Inc.

Mr. Johnson has served as Vice President, Koppers Utility and Industrial Products since April 2018. From January 2010 to April 2018, he served as President and CEO of Cox Industries Inc., a privately-owned business specializing in the manufacturing and global distribution of pressure-treated utility poles and marine construction products, which we acquired in April 2018.

Mr. Lacy has served as Chief Administrative Officer, General Counsel and Secretary of Koppers Holdings Inc. and Koppers Inc. since January 2018. Mr. Lacy had previously served as Senior Vice President, Administration, General Counsel and Secretary of Koppers Holdings Inc. since November 2004 and served as Senior Vice President, Administration, General Counsel and Secretary of Koppers Inc. since January 2004. Mr. Lacy has served as a Director of Koppers Inc. since May 2013.

Mr. Sullivan has served as Senior Vice President, Railroad Products and Services and Global Carbon Materials and Chemicals, Koppers Inc. since May 2018. Prior to that, Mr. Sullivan served as Senior Vice President, Global Carbon

Materials and Chemicals of Koppers Inc. from April 2014 to May 2018. Mr. Sullivan had been elected Vice President of Business Development, Koppers Inc. in June 2013.

Mr. Zugay has served as Chief Financial Officer and Treasurer of Koppers Holdings Inc. and Koppers Inc. since August 2018. Prior to that, Mr. Zugay served as Chief Financial Officer of Koppers Holdings Inc. and Koppers Inc. from August 2014 to August 2018. Prior to joining Koppers, Mr. Zugay was Co-Chief Executive Officer for Michael Baker Corporation (engineering and other consulting services) from December 2012 to October 2013. Mr. Zugay served as Chief Financial Officer of Michael Baker Corporation from February 2009 to January 2014. Mr. Zugay has served as a Director of Koppers Inc. since May 2015.

PART II

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

Our shares of common stock are listed and traded on the NYSE under the symbol “KOP”.

The number of registered holders of Koppers common stock at January 31, 2019 was 118.

Dividend Policy

In 2006, our board of directors adopted a dividend policy that provided for quarterly dividends, payable at the discretion of our board of directors. Dividends will be considered if cash generated by our business is in excess of our expected cash needs. Our expected cash needs include operating expenses and working capital requirements, interest and principal payments on our indebtedness, capital expenditures, incremental costs associated with being a public company, acquisitions, taxes and certain other costs. On an annual basis we expect to pay dividends, if declared, with cash flow from operations, but, due to seasonal or other temporary fluctuations in cash flow, we may from time to time use temporary short-term borrowings to pay quarterly dividends.

We are not required to pay dividends, and our shareholders will not be guaranteed, or have contractual or other rights, to receive dividends. Nevertheless, our board of directors may decide, in its discretion, at any time, to otherwise modify or repeal the dividend policy. We have not declared a dividend since November 2014. Any future determination to declare and pay dividends will be made at the discretion of our board of directors, after taking into account our financial results, capital requirements and other factors it may deem relevant.

Because we are a holding company, substantially all the assets shown on our consolidated balance sheet are held by our subsidiaries. Accordingly, our earnings and cash flow and our ability to pay dividends are dependent upon the earnings and cash flows of our subsidiaries and the distribution or other payment of such earnings to us in the form of dividends. Our ability to pay dividends is restricted by limitations on the ability of our only direct subsidiary, Koppers Inc., to pay dividends, as a result of limitations imposed by Koppers Inc.’s credit agreement, the indenture governing Koppers Inc.’s 2025 Notes and by Pennsylvania law. See “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Liquidity and Capital Resources – Restrictions on Dividends to Koppers Holdings.”

Issuer Purchases of Equity Securities

No shares were repurchased in the three months ended December 31, 2018 under the current $75 million share repurchase program approved in November 2011. The approximate dollar value of common shares that may yet be purchased under this program is $24.8 million. The repurchase program has no expiration date.

ITEM 6. SELECTED FINANCIAL DATA

The following table contains our selected historical consolidated financial data for the five years ended December 31, 2018. The selected historical consolidated financial data for each of the years ended December 31, 2018, 2017, 2016, 2015 and 2014 have been derived from our audited consolidated financial statements. This selected financial data should be read in conjunction with Koppers' Consolidated Financial Statements and related notes included elsewhere in this Annual Report on Form 10-K as well as Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

	Year Ended December 31,				
	2018	2017	2016	2015	2014
(Dollars in millions, except share and per share amounts)					
Statement of Operations Data:					
Net sales	$1,710.2	$1,475.5	$1,416.2	$1,626.9	$1,555.0
Depreciation and amortization	50.8	49.8	52.9	59.0	44.0
Impairment and restructuring charges (1)	4.0	16.2	20.1	42.2	17.9
Goodwill impairment (2)	0.0	0.0	0.0	67.2	0.0
Operating profit (loss)	110.4	123.6	93.4	(29.6)	33.2
Interest expense	56.3	42.5	50.8	50.7	39.1
Income (loss) from continuing operations	28.8	31.3	27.1	(75.9)	(40.0)
Income (loss) from discontinued operations	0.4	(0.8)	0.6	(0.1)	0.6
Net income (loss) (3)	29.2	30.5	27.7	(76.0)	(39.4)
Net income (loss) attributable to Koppers	23.4	29.1	29.3	(72.0)	(32.4)
Earnings (loss) from Continuing Operations Per Common Share Data:					
Basic – continuing operations	$1.10	$1.44	$1.39	$(3.50)	$(1.61)
Diluted – continuing operations	1.08	1.36	1.36	(3.50)	(1.61)
Weighted average common shares outstanding (in thousands):					
Basic	20,871	20,754	20,636	20,541	20,463
Diluted	21,326	22,000	21,055	20,541	20,463
Balance Sheet Data:					
Cash and cash equivalents	$40.6	$60.3	$20.8	$21.8	$51.1
Total assets (4)	1,479.9	1,200.2	1,087.5	1,137.9	1,308.4
Total debt (4)	990.4	677.0	662.4	722.3	836.0
Other Data:					
Capital expenditures	$109.7	$67.5	$49.9	$40.7	$83.8
Cash dividends declared per common share	$0.00	$0.00	$0.00	$0.00	$1.00

(1) Includes plant closure and severance costs totaling $3.9 million related to the decision to discontinue coal tar distillation activities at two CMC plants located in the United States and plant closure costs totaling $0.1 million related to the restructuring of one RUPS wood treating plant in the United States for the year ended December 31,

2018. Includes plant closure and severance costs totaling $14.6 million related to the decision to discontinue coal tar distillation activities at two CMC plants located in the United States and plant closure costs totaling $1.6 million related to the restructuring of two RUPS wood treating plants in the United States for the year ended December 31, 2017. Includes plant closure and severance costs totaling $13.2 million related to the decision to discontinue coal tar distillation activities at two CMC plants located in the United States and two CMC plants located in the United Kingdom and plant closure and severance costs totaling $6.9 million related to the restructuring of three RUPS wood treating plants in the United States for the year ended December 31, 2016. Includes plant closure and severance costs totaling $36.5 million related to the decision to discontinue coal tar distillation activities at two CMC plants located in the United States and two CMC plants located in the United Kingdom and plant closure and severance costs totaling $5.7 million related to the closure of the RUPS wood treating plant in Green Spring, West Virginia for the year ended December 31, 2015. Includes plant closure and severance costs totaling $13.2 million related to the closure of the Company’s coal tar distillation facility in Uithoorn, the Netherlands and fixed asset impairment charges totaling $4.7 million related to the Company’s coal tar distillation facility located in Tangshan China for the year ended December 31, 2014.

(2) In 2015, the Company recorded a $67.2 million impairment charge related to goodwill for the CMC business segment.
(3) Income tax expense (benefit) for 2018 and 2017 was impacted by $4.8 million and $20.5 million, respectively, related to the Tax Cuts and Jobs Act of 2017. Income tax expense (benefit) for 2015 and 2014 was impacted by $(16.1) million related to CMC goodwill impairment and $24.3 million related to a legal entity restructuring project, respectively.
(4) The acquisition of UIP and KRR materially affect the comparability of these amounts for years prior to December 31, 2018.

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

Overview

We are a leading integrated global provider of treated wood products, wood preservation chemicals, and carbon compounds. Our products and services are used in a variety of niche applications in a diverse range of end-markets, including the railroad, specialty chemical, utility, residential lumber, agriculture, aluminum, steel, rubber, and construction industries. We serve our customers through a comprehensive global manufacturing and distribution network, with manufacturing facilities located in North America, South America, Australasia, China and Europe.

We operate three principal businesses: Railroad and Utility Products and Services ("RUPS"), Performance Chemicals ("PC") and Carbon Materials and Chemicals ("CMC").

Through our RUPS business, we believe that we are the largest supplier of railroad crossties to the North American railroads. Our other treated wood products include utility poles for the electric and telephone utility industries in the United States and Australia. We also provide rail joint bar products as well as various services to the railroad industry. In April 2018, we re-entered the North American utility pole market with the acquisition of Cox Industries, Inc., which has been renamed Koppers Utility and Industrial Products Inc. ("UIP"). UIP manufactures and sells utility poles and construction and marine pilings through a network of eight manufacturing facilities and 19 distribution yards located throughout the United States. In February 2018, Koppers Inc. acquired M.A. Energy Resources, LLC, a business related to the recovery of used crossties, which was renamed Koppers Recovery Resources LLC ("KRR") subsequent to the acquisition.

Through our PC business, we believe that we are the global leader in developing, manufacturing and marketing wood preservation chemicals and wood treatment technologies for use in the pressure treating of lumber for residential, industrial and agricultural applications. Our CMC business processes coal tar into a variety of products, including creosote, carbon pitch, carbon black feedstock, naphthalene and phthalic anhydride, which are intermediate materials necessary in the pressure treatment of wood, the production of aluminum, the production of carbon black, the production of high-strength concrete, and the production of plasticizers and specialty chemicals, respectively.

Outlook

Trend Overview

Our businesses and results of operations are affected by various competitive and other factors including (i) the impact of global economic conditions on demand for our products, including the impact of imported products from competitors in certain regions where we operate; (ii) raw material pricing and availability, in particular the cost and availability of hardwood lumber for railroad crossties and softwood lumber for utility poles, scrap copper prices, and the cost and amount of coal tar available in global markets, which is negatively affected by reductions in blast furnace steel production; (iii) volatility in oil prices, which impacts the cost of coal tar and certain other raw materials, as well as selling prices and margins for certain of our products including carbon black feedstock, phthalic anhydride, and naphthalene; (iv) competitive conditions in global carbon pitch markets; and (v) changes in foreign exchange rates.

Railroad and Utility Products and Services

We provide our customers with treated and untreated wood products, rail joint bars and services primarily for the railroad markets in the United States and Canada. In addition, we supply treated utility poles for the utility sector in the United States and Australia. The primary end-markets for RUPS is the North American railroad industry, which has an installed base of approximately 700 million wood crossties, and the investor-owned utility industry which utilizes wooden distribution and transmission poles. Both crossties and utility poles require periodic replacement.

Historically, North American demand for crossties had been in the range of 22-25 million annually. However, the crosstie replacement market has been significantly lower in recent years. According to the Railway Tie Association ("RTA"), Class I railroads estimated crosstie installations of approximately 16 million in 2018 followed by a similar amount in 2019. For distribution poles, the demand has historically been in the range of two to three million annually. We also operate a railroad services business that conducts engineering, design, repair and inspection services primarily for railroad bridges in the U.S. and Canada.

The supply of untreated crossties can vary at times based upon weather conditions in addition to other factors. We have a nationwide wood procurement team that maintains close working relationships with a network of sawmills. We procure untreated crossties, either on behalf of our customers, or for future treating. We also procure switch ties and various other types of lumber used for railroad bridges and crossings. Untreated crossties go through a six- to nine-month air seasoning process before they are ready to be pressure treated. After the air seasoning process is complete, the crossties are pressure treated using creosote-only treatment or a combined creosote and borate treatment. During any given year, there is a seasonal effect in the winter months on our crosstie business depending on weather conditions for harvesting lumber and installation.

In 2018, the major companies in the rail industry again substantially reduced both operating and capital spending from peak spending levels, which had a negative impact on sales of various products and services that we provide to that industry. Current year revenues and profitability reflected a decline year-over-year due to the effects of lower demand caused by continued reductions in capital budgets for most North American Class I railroads. We currently supply all seven of the North American Class I railroads and have long-standing relationships with these customers. Approximately 70 percent of our North American sales are under long-term contracts and we believe that we are positioned to maintain or grow our current market position.

According to the Association of American Railroads, the level of business activity for the railroad industry is dependent on, to a large extent, trends occurring in other sectors of the economy. In the recent past, the Class I railroads were highly dependent on the oil and gas and coal mining industries. Currently, the railroads are more correlated to trade relations, commodity prices and interest rates. Rail traffic has continued to be relatively positive, with intermodal especially strong due to its close relation to consumer spending. However, there has been weakness in some commodity categories. For the year ended December 31, 2018, total U.S. carload traffic was up 1.8 percent from last year while intermodal units were up 5.5 percent from the prior year. For the year ended December 31, 2018, combined U.S. traffic for carloads and intermodal units was 3.7 percent higher than prior year. Although year-over-year rail traffic has steadily increased during the past several years, the amount of heavy-haul loads such as coal and fracking sands have declined significantly from historical levels. As a result, this translates into lighter-weight loads having less wear on tracks and ties.

Over an economic cycle, the long-term prognosis for the railroad industry and the products and services that we provide to it are generally favorable. However, in the near-term, railroad customers have scaled back and are focusing on reducing their operating costs and working capital. As a result, the demand for treated crossties for 2018 has been relatively flat to lower than the prior year. In 2019, we expect demand to stabilize and modestly improve in the second half of the year, contingent on the availability of lumber for untreated crosstie production.

In terms of raw material, there was less available inventory of untreated crossties from the saw mills during 2018 and lumber prices increased dramatically due to a wet spring and summer affecting production. Currently, the RTA reports that the hardwood lumber demand has been softening with sharp declines in hardwood lumber sales volumes due to changing economic conditions in China. In addition, the potential effects from impending tariffs on trade between China and the U.S. may negatively impact the hardwood industry and the availability of lumber. For much of 2018, we experienced a tightness in the supply of untreated crosstie supply which challenged our ability to procure needed inventory. However, that seems to be alleviated somewhat as demand from China has softened. In the early part of 2019, many saw mills are again experiencing challenges related to unfavorable weather conditions hampering the procurement of untreated crossties. To the extent that we can build our untreated tie inventory, we anticipate having higher levels of dry crosstie inventory ready for treatment.

In addition, over the last several years, certain Class I railroads have shifted from a treatment-service only model to having suppliers hold untreated inventory until the crossties have been treated. Going forward, we estimate that the remaining potential impact of this transition could be a further increase of working capital by approximately $50 million primarily due to higher inventory, and the associated revenue cycle could be temporarily extended for approximately six to nine months, for approximately $50 million in total. The actual timing of this impact will be dependent on the date, if at all, the remaining customer makes the transition.

From a long-term perspective, there remains a need for sustained investment in infrastructure and capacity expansion. We believe that with our vertical integration capabilities in wood treatment and strong customer relationships, we will ultimately benefit from increased demand.

Performance Chemicals

The largest geographic market for wood treating chemicals sold by our PC business is in North America, and the largest application for our products is the residential remodeling market. We also have a market presence in Europe, South America, Australia, New Zealand and Africa. We believe that PC is the largest global manufacturer and supplier of water-based wood preservatives and wood specialty additives to treaters who supply pressure treated wood products to large retailers and independent lumber dealers. These retailers and dealers, in turn, serve the residential, agricultural and industrial pressure-treated wood market. Our primary products are copper-based wood preservatives, including micronized copper azole ("MicroPro®") and micronized pigments ("MicroShades®").

In North America, we are vertically integrated due to our manufacturing capabilities for copper compounds for our copper-based wood preservatives. We believe our vertical integration is part of our proprietary processes and reflects an important competitive advantage. Applications for these products include decking, fencing, utility poles, construction lumber and other outdoor structures.

As most of the products sold by PC are copper-based products, changes in the price and availability of copper can have a significant impact on product pricing and margins. We attempt to moderate the variability in copper pricing over time by entering into hedging transactions for the majority of our copper needs, which primarily range from six months up to 36 months. These hedges typically match expected customer purchases and receive hedge accounting treatment. From time to time, we enter into forward transactions based upon long-term forecasted needs of copper. These forward positions are typically marked to market on a quarterly basis.

Product demand for our PC business has historically been closely associated with consumer spending on home repair and remodeling projects, and therefore, trends in existing home sales serve as a leading indicator. Overall, the market for existing homes continues to show mixed signals. According to the National Association of Realtors® ("NAR"), existing home sales declined in December after two consecutive months of increases. None of the four major U.S. regions saw a gain in sales activity in the month. The NAR reported that total existing-home sales decreased 6.4 percent from November and was down 10.3 percent from a year ago.

According to the Leading Indicator of Remodeling Activity ("LIRA") reported by the Joint Center for Housing Studies of Harvard University, the annual growth in the national market for home improvement and repair has been revised lower and is now expected to grow 5.1 percent compared to 7.5 percent previously. Even so, LIRA projects that spending on these areas is still anticipated to expand to more than $350 billion nationally.

The Conference Board Consumer Confidence Index® decreased in December to 128.1, down from 136.4 in November. Consumers' assessment of current conditions has declined, which is attributed to an increasing concern that the pace of economic growth will begin moderating in the first half of 2019.

From a margin perspective, our profitability has been unfavorably impacted by rising raw material costs, primarily due to copper prices which began to trend higher in 2017 and continuing into 2018 but has pulled back from highs reached in the first half of 2018. Our strategy is to hedge a majority of our requirements over a two-to-three year time frame in order to provide short-term certainty and visibility of our cost structure by lessening the impact that may arise in commodity markets. In a rising copper price environment such as in the past eighteen months, our average hedged prices have increased from prior year and we expect that to continue in 2019. We have begun hedging for our input needs in 2020 and as long as copper prices remain at current levels, we anticipate a year-over-year benefit for that time period. We have implemented pricing actions, where possible, to partially offset the impact of higher input costs.

Carbon Materials and Chemicals

The primary products produced by CMC are creosote, which is a registered pesticide in the U.S. and used primarily in the pressure treatment of railroad crossties, and carbon pitch, which is sold primarily to the aluminum industry for the production of carbon anodes used in the smelting of aluminum. We have reduced capacity in our CMC plants in North America and Europe over the past several years to levels required to meet creosote demand in North America for the treatment of railroad crossties. We currently supply our North American RUPS business with 100 percent of its creosote requirements. As discussed in the RUPS outlook, there has been a decrease starting in 2017 with respect to spending for railroad infrastructure. This results in a shift in excess distillate production to the commodity carbon black feedstock market until demand stabilizes for creosote and eventually returns to higher levels.

While the sale of carbon pitch remains a significant portion of our sales volume, the reduction of aluminum smelting capacity in the United States, Australia and Western Europe has led to sharply lower demand for carbon pitch over the past several years. Accordingly, we have experienced significantly lower sales volumes due to the reduction in aluminum production in parts of the world where the majority of our production facilities are located. However, beginning in 2018, aluminum production in the U.S. increased to some extent as tariffs are being imposed on certain imported steel and aluminum products that has stimulated restarts of previously idled capacity. This development has resulted in additional demand for carbon pitch in the United States that can likely only be sustained through a continuation of current trade policy.

The availability of coal tar, the primary raw material for our CMC business, is linked to levels of metallurgical coke production. As the global steel industry, excluding Asia, has reduced the production of steel using metallurgical coke, the volumes of coal tar have also been reduced. For the past decade, the coal tar distillation industry has operated in an excess capacity mode, which further increased the competition for a limited amount of coal tar in North America. Over the past three years we have consolidated our operating footprint and significantly lowered production levels at the same time that we added distribution assets to move finished products from Europe to the U.S. more efficiently. As a result, our raw material needs in North America have been significantly less than historically required. In early 2017, we entered into several new long-term supply agreements to further lower our exposure to coal tar availability risk and volatile end markets.

In recent quarters, there has been an overall tightening market supply of coal tar and carbon pitch in China and it has put upward pressure on both raw materials and finished product pricing. This is due to an ongoing shutdown of older steel and coking capacity that does not meet environmental and emissions requirements. In turn, the shutdowns have resulted in increased demand for products requiring coal tar pitch, including needle coke used for producing electrodes that go into electric arc steel production, which is the primary market that we serve in China. As a result, our coal-tar distillation facility constructed in 2015 serving those markets has a competitive advantage. During 2018, pricing for coal tar products in the region moderated but remains relatively strong compared to prior year. For the external markets served by our CMC business, we anticipate that while Europe, North America and Australia will benefit from favorable demand levels, the margin will be negatively impacted by higher cost of raw materials in 2019.

With respect to our largest customer in China, we believe that the pricing we have received has been understated for a number of quarterly periods. While we continue to engage in discussions with this customer and hope to resolve the disagreement in accordance with certain provisions in our contractual relationship, we have not recognized any incremental revenue associated with the higher price that we believe is accurate. Therefore, our sales and margin in China were negatively impacted in 2018 due to lower volume requirements from this customer.

Going forward, the stronger demand has had a positive effect on pricing for the key raw material that we provide to this industry.

CMC Restructuring Initiatives

We embarked on a plan to restructure our CMC operating footprint that reduced our global number of coal tar distillation facilities from the eleven that existed as of January 1, 2014 to four in total. The remaining facilities are located in regions where we believe we hold key competitive advantages that allow us to better serve our global customers: Stickney, Illinois; Nyborg, Denmark; Mayfield, Australia; and Jiangsu Province, China.

As a result of the reduction in operating capacity at the seven closed or sold coal tar distillation facilities, we have incurred substantial restructuring and impairment costs over the last four years. As a result of these initiatives, we expect additional restructuring and related charges to earnings of $5.0 million to $7.0 million through 2020. The overall expected future cash requirements for the CMC plant closures are estimated to be approximately $20 million through 2021. There may be additional curtailments or closures at our other CMC facilities as part of our efforts to reduce our cost structure and improve capacity utilization in our business. In October 2018, we completed the sale of our Clairton, Pennsylvania facility and, in doing so, transferred cash along with substantially all assets at the facility to the purchaser in exchange for the purchaser assuming certain historical and future obligations, including full responsibility for facility decommissioning, demolition and site restoration.

Through these restructuring initiatives, we are significantly transforming our CMC business model by streamlining the operating footprint and reducing our primary reliance on and exposure to the carbon pitch markets. In addition, the construction of a new naphthalene unit at our Stickney, Illinois, facility, which we completed commissioning in the third quarter of 2018, is anticipated to result in additional production efficiencies and cost savings going forward. All intermediate feedstocks are now being processed in Stickney as the new unit is now fully online. We believe that the extensive and ongoing efforts to reduce our fixed cost structure will result in a sustainable improvement in earnings in addition to lower volatility in cash flow.

Seasonality and Effects of Weather on Operations

Our quarterly operating results fluctuate due to a variety of factors that are outside of our control, including inclement weather conditions, which in the past have affected operating results. Operations at some of our facilities have at times been reduced during the winter months. Moreover, demand for some of our products declines during periods of inclement weather. As a result of the foregoing, we anticipate that we may experience material fluctuations in quarterly operating results. Historically, our operating results have been significantly lower in the first and fourth calendar quarters as compared to the second and third calendar quarters.

Results of Operations – Comparison of Years Ended December 31, 2018 and December 31, 2017

Consolidated Results

Net sales for the years ended December 31, 2018 and 2017 are summarized by segment in the following table:

	Year Ended December 31,			
	2018	2017	Net Change	
(Dollars in millions)				
Railroad and Utility Products and Services	$634.8	$512.6	24	%
Performance Chemicals	420.0	411.2	2	%
Carbon Materials and Chemicals	655.4	551.7	19	%
	$1,710.2	$1,475.5	16	%

RUPS net sales for the year ended December 31, 2018 increased by $122.2 million or 24 percent compared to the prior year. The sales increase was primarily due to the acquisitions of UIP and KRR in the current year as well as volume increases in the commercial tie and rail joint markets in the current year. These increases were offset by lower treating volumes of Class I crossties. Sales of Class I crossties declined by $61.7 million. This was primarily due to decreased spending in the rail industry, particularly the Class I market as certain Class I railroads have shifted from a treatment-service only model to having suppliers hold untreated inventory until the crossties have been treated. More recently, a lack of dry crosstie inventory has also contributed to reduced treating volumes.

PC net sales for the year ended December 31, 2018 increased by $8.8 million or two percent compared to the prior year. The slightly higher sales were due primarily to higher volumes in Australasia for light organic solvent preservatives as well as a favorable mix of pricing and demand in North America. During the year, price volatility in the lumber market limited customer inventory and reduced customer demand for copper-based wood preservatives.

CMC net sales for the year ended December 31, 2018 increased by $103.7 million or 19 percent compared to the prior year due mainly to higher sales prices for carbon pitch, carbon black feedstock and naphthalene partially offset by reduced volumes in North America and Europe. In Australia and Europe, higher sales prices for carbon pitch and carbon black feedstock were driven primarily by higher raw material cost and increases in global benchmark oil pricing.

Cost of sales as a percentage of net sales was 80 percent for the year ended December 31, 2018, compared to 78 percent in the prior year. Higher gross margins for CMC were driven by higher sales prices for carbon pitch, carbon black feedstock and naphthalene. These were offset by lower gross margins for PC driven by higher raw material costs and lower gross margins for RUPS due to reduced sales volumes of crossties in the Class I market combined with reduced margins as a result of higher raw material supply costs.

Depreciation and amortization charges for the year ended December 31, 2018 were $1.0 million higher when compared to the prior year period due mainly to assets placed in service over the past year related to our new naphthalene unit construction at our CMC plant in Stickney, Illinois along with depreciation and amortization from our acquisitions in the current year period.

Loss on sale of assets of $8.3 million for the year ended December 31, 2018 reflects sales of our coal tar distillation facility in Clairton, Pennsylvania and our specialty chemicals business in the United Kingdom within our CMC segment as well as a sale of assets in the United Kingdom within our PC segment.

Impairment and restructuring charges were $12.2 million lower for the year ended December 31, 2018 due mainly to prior year charges for restructuring-related storage tank decommissioning costs and accelerated depreciation for the remaining fixed assets at our coal tar distillation facilities in Clairton, Pennsylvania and Follansbee, West Virginia. Current year charges consist primarily of remaining restructuring-related costs and depreciation at our Follansbee, West Virginia facility.

Selling, general and administrative expenses for the year ended December 31, 2018 were $29.1 million higher when compared to the prior year period due primarily to $18.5 million of incremental costs within KRR and UIP, $6.5 million of acquisition-related expenses and $3.3 million from higher compensation expense.

Interest expense for the year ended December 31, 2018 was $13.8 million higher than the prior year period primarily due to the higher average debt level to fund our acquisitions of UIP and KRR.

Loss on pension settlement was $10.0 million in 2017. In the fourth quarter of 2017, the Company offered a cash lump sum or annuity buyout to its terminated deferred vested participants in its U.S. defined benefit pension plan. Approximately 100 participants elected either a lump sum payout or annuity from a third-party provider. The total dollar amount paid out of our defined benefit plan assets was $3.1 million and the Company recorded a pension settlement charge of $1.2 million related to this transaction.

In the third quarter of 2017, the Company completed an irrevocable transaction with an insurance company to annuitize approximately $31 million of retiree pension obligations in its U.S. qualified defined benefit pension plan for a selected group of retirees. The transaction was funded by transferring a similar amount of assets from the pension plan to the insurance company. Subsequent to this transfer, the insurance company has assumed all remaining pension obligations associated with these retirees. The Company recorded a pension settlement loss of $8.8 million in the third quarter of 2017.

Loss on extinguishment of debt for the year ended December 31, 2017 was $13.3 million. In 2017, all of our senior notes due 2019 were repurchased at a premium to carrying value and accordingly, we realized a loss on extinguishment of debt totaling $10.0 million consisting of $7.3 million for bond premium and bond tender expenses and $2.7 million for the write-off of unamortized debt issuance costs. In addition, we repaid our term loan in full and entered into a new Revolving Credit Facility and recorded a loss of $3.3 million for the write-off of unamortized debt issuance costs.

Income taxes for the year ended December 31, 2018 were $3.0 million lower when compared to the prior year period.

On December 22, 2017, the Tax Act was signed into law. The Tax Act significantly revises the U.S. corporate income tax system by, among other things, lowering the corporate income tax rate to 21 percent from 35 percent and imposing a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries. Beginning in 2018, the Tax Act also requires an income inclusion of foreign corporations’ global intangible low-taxed income or GILTI and also introduces a limitation on the amount of interest expense that is deductible.

In the year ended December 31, 2017, the Company recorded an estimate of this one-time transition tax and recorded a charge to income tax expense of $13.1 million. As a result of the corporate rate reduction to 21 percent, the Company recorded a charge of $7.4 million to adjust the carrying value of our net deferred tax assets in the U.S.

In the year ended December 31, 2018, the Company completed its analysis of the impact of the one-time transition tax and the adjustment to our net deferred tax assets in the U.S. and recorded an additional $4.7 million of income tax expense.

The Company has included the impact of the GILTI inclusion and the limitation on deductible interest expense in its 2018 tax provision. Although the interest expense deduction that is disallowed in the current year can be carried forward to future years, the Company has concluded that, in the foreseeable future, it will not be able to benefit from the disallowed interest expense deduction. Therefore, a valuation allowance has been recorded against this deferred tax asset. The Company has recorded income tax expense of $15.6 million for the impact of the GILTI inclusion and the limitation on deductible interest expense.

The effective income tax rate for the year ended December 31, 2018 was 47.4 percent. The effective income tax rate is higher than the U.S. statutory income tax rate of 21.0 percent due to the impact of the Tax Act partially offset with the reversal of a valuation allowance for a subsidiary in China that will be able to realize its net operating losses.

The effective income tax rate for the year ended December 31, 2017 was 48.1 percent. The effective income tax rate is higher than the U.S. statutory income tax rate of 35.0 percent due to the impact of the Tax Act. This increase due to the Tax Act is partially offset by a significant amount of foreign pre-tax earnings that are taxed at income tax rates lower than the U.S. statutory income tax rate.

Segment Results

Segment operating profit for the years ended December 31, 2018 and 2017 is summarized by segment in the following table:

	Year Ended December 31,		
(Dollars in millions)	2018	2017	% Change
Operating profit (loss):			
Railroad and Utility Products and Services	$5.9	$26.2	-77 %
Performance Chemicals	36.2	71.4	-49 %
Carbon Materials and Chemicals	70.7	28.0	153 %
Corporate	(2.4)	(2.0)	-20 %
	$110.4	$123.6	-11 %
Operating profit as a percentage of net sales:			
Railroad and Utility Products and Services	0.9 %	5.1 %	-4.2 %
Performance Chemicals	8.6 %	17.4 %	-8.8 %
Carbon Materials and Chemicals	10.8 %	5.1 %	5.7 %
	6.5 %	8.4 %	-1.9 %

RUPS operating profit for the year ended December 31, 2018 decreased by $20.3 million or 77 percent compared to the prior year. Operating profit as a percentage of sales decreased to 0.9 percent from 5.1 percent. Operating profit as a percentage of net sales for the year ended December 31, 2018 was impacted by reduced treating volumes of crossties to Class I customers. Additionally, we have experienced margin pressure from higher costs of raw materials from saw mills due to increased demand. The segment was also negatively impacted by $6.0 million in the current year period due to inventory purchase price fair value adjustments from the UIP acquisition.

PC operating profit decreased by $35.2 million or 49 percent compared to the prior year. Operating profit as a percentage of net sales for PC decreased to 8.6 percent from 17.4 percent in the prior year. Higher raw material prices, selling, general and administrative expenses, and transportation costs along with short-term supply disruptions more than offset our slight increase in sales for the year ended December 31, 2018. In addition, the current year period was unfavorably impacted by a net amount of $16.0 million due to changes in unrealized gains and losses from our copper swap contracts as compared to the prior year period.

CMC operating profit for the year ended December 31, 2018 increased by $42.7 million or 153 percent compared to the prior year. Operating profit as a percentage of net sales for CMC increased to 10.8 percent from 5.1 percent in the prior year period. Operating profit for the year ended December 31, 2018 was positively affected by higher sales prices for most products and regions within the segment, primarily attributed to carbon pitch, and a more streamlined and efficient cost structure. These positive results were partially offset by reduced margins in China due to the impact of a temporary plant curtailment of our largest customer, lower sales volumes in North America, Australasia and Europe and higher raw material costs in Australasia and Europe.

Results of Operations – Comparison of Years Ended December 31, 2017 and December 31, 2016

Consolidated Results

Net sales for the years ended December 31, 2017 and 2016 are summarized by segment in the following table:

	Year Ended December 31,			
	2017	2016	Net Change	
(Dollars in millions)				
Railroad and Utility Products and Services	$512.6	$586.5	-13	%
Performance Chemicals	411.2	393.4	5	%
Carbon Materials and Chemicals	551.7	436.3	26	%
	$1,475.5	$1,416.2	4	%

Railroad and Utility Products and Services net sales for the year ended December 31, 2017 decreased by $73.9 million or 13 percent compared to the prior year. The sales decrease was primarily due to lower sales volumes of crossties and railroad bridge services, partially offset by higher sales volumes of utility products. Sales of crossties and railroad bridge services declined by $72.3 million. The reduction in treated crossties and structure services is attributed to lower spending in the rail industry across both the Class I and commercial markets. In addition, commercial crosstie pricing has been reduced due to an over-supply of crossties in the commercial market. Sales of utility products increased by $4.0 million due to increased demand for structural timber in Australia.

Performance Chemicals net sales for the year ended December 31, 2017 increased by $17.8 million or five percent compared to the prior year. The sales increase was due primarily to higher North American sales volumes for some copper-based wood preservatives and additives. Higher sales volumes were driven primarily by favorable market trends in the repair and remodeling markets and existing home sales as well as treated wood dealers stocking and selling treated wood with higher preservative retention levels. These gains were offset in part by higher customer development costs, which are reflected as a reduction of net sales, compared to the prior year.

Carbon Materials and Chemicals net sales for the year ended December 31, 2017 increased by $115.4 million or 26 percent compared to the prior year due mainly to higher sales prices for carbon black feedstock, carbon pitch and coal tar chemicals with higher sales volumes for carbon black feedstock and coal tar chemicals, partially offset by lower creosote volumes. Our strategy is to sell as much distillate production to the higher value wood preservative market, however there was a reduction in creosote volume driven by lower demand for treated crossties during 2017. The excess distillate was sold as carbon black feedstock. Sales of coal tar chemicals increased over the prior year period due to increases in sales volumes and pricing of phthalic anhydride and naphthalene. The increases, in part, were driven by the effect of higher orthoxylene prices, which favorably impact phthalic anhydride market prices. Higher sales prices for carbon pitch and carbon black feedstock in Australasia and Europe were driven primarily by reduced supply in those regions.

Cost of sales as a percentage of net sales was 78 percent for the year ended December 31, 2017, compared to 80 percent in the prior year due mainly to higher gross margins for CMC driven by lower raw material and shipping costs and higher sales prices in certain regions. In addition, a sales mix shift for PC improved our results as higher gross margins were driven by increased sales volumes in higher margin product lines. This more than offset lower sales volumes and gross margins from RUPS due to reduced sales volumes of crossties and railroad services combined with reduced margins in the commercial crosstie market as a result of inventory over-supply.

Depreciation and amortization charges for the year ended December 31, 2017 were $3.1 million lower when compared to the prior year period due mainly to a reduction in assets, excluding assets under construction, related to our shutdown of distillation facilities in the United States and United Kingdom.

Gain on sale of assets of $2.1 million for the year ended December 31, 2016 reflected the sale of our CMC tar distillation properties and assets in the United Kingdom in July 2016.

Impairment and restructuring charges were $3.9 million lower for the year ended December 31, 2017 due mainly to a prior year accrual for exited real estate lease obligations, net of estimated sublease revenue, at our closed coal tar distillation facility in Uithoorn, the Netherlands, as well as severance charges related to our closed coal tar distillation CMC facilities in the United Kingdom and impairment charges for the remaining fixed assets at our coal tar distillation facility in Clairton, Pennsylvania. Current year charges consist of restructuring-related storage tank decommissioning costs and accelerated depreciation for the remaining fixed assets at our coal tar distillation facilities in Clairton, Pennsylvania and Follansbee, West Virginia.

Selling, general and administrative expenses for the year ended December 31, 2017 were $5.9 million higher when compared to the prior year due mainly to increases in consulting costs and stock-based compensation expense offset by decreases in customer development costs.

Interest expense for the year ended December 31, 2017 was $8.3 million lower when compared to the prior year as a result of reduced average debt levels and reduced interest rates related to our 2025 Notes and our Revolving Credit Facility.

Loss on pension settlement for the year ended December 31, 2017 was $5.6 million higher when compared to the prior year. In the fourth quarter of 2017, the Company offered a cash lump sum or annuity buyout to its terminated deferred vested participants in its U.S. defined benefit pension plan. Approximately 100 participants elected either a lump sum payout or annuity from a third-party provider. The total dollar amount paid out of our defined benefit plan assets was $3.1 million and the Company recorded a pension settlement charge of $1.2 million related to this transaction.

In the third quarter of 2017, the Company completed an irrevocable transaction with an insurance company to annuitize approximately $31 million of retiree pension obligations in its U.S. qualified defined benefit pension plan for a selected group of retirees. The transaction was funded by transferring a similar amount of assets from the pension plan to the insurance company. Subsequent to this transfer, the insurance company has assumed all remaining pension obligations associated with these retirees. The Company recorded a pension settlement loss of $8.8 million in the third quarter of 2017.

In the third quarter of 2016, the Company offered a cash lump sum or annuity buyout to its terminated deferred vested participants in its U.S. defined benefit pension plan. Approximately 375 participants elected either a lump sum payout or annuity from a third-party provider. The total dollar amount paid out of our defined benefit plan assets was $13.9 million and the Company recorded a pension settlement charge of $4.4 million for the year ended December 31, 2016.

Loss on extinguishment of debt for the year ended December 31, 2017 was $13.3 million higher when compared to the prior year period. In the current year period, all of our senior notes due 2019 were repurchased at a premium to carrying value and accordingly, we realized a loss on extinguishment of debt totaling $10.0 million consisting of $7.3

million for bond premium and bond tender expenses and $2.7 million for the write-off of unamortized debt issuance costs. In addition, we repaid our term loan in full and entered into a new Revolving Credit Facility and recorded a loss of $3.3 million for the write-off of unamortized debt issuance costs.

Income taxes for the year ended December 31, 2017 were $17.6 million higher when compared to the prior year period. The increase in tax expense is primarily due to the Tax Act.

Changes in tax rates and tax laws to deferred taxes are accounted for in the period of legislative enactment. 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. As a result of the corporate rate reduction to 21 percent, the Company recorded a charge of $7.4 million for the year ended December 31, 2017 from reducing the value of our net deferred tax assets in the U.S.

The Tax Act imposes a one-time transition tax on unrepatriated earnings of foreign subsidiaries through December 31, 2017 that have not previously been subject to federal tax. The Company recorded an estimate of this one-time transition tax and recorded a charge to income tax expense of $13.1 million.

The effective income tax rate for the year ended December 31, 2017 was 48.1 percent. The effective income tax rates for the years ended December 31, 2017 and December 31, 2016 without the effect of the Tax Act were 14.1 percent and 29.6 percent, respectively. The decrease in the effective income tax rate is primarily due to an increase in foreign pre-tax earnings that are taxed at more favorable rates. Additionally, in the prior period, we incurred losses in certain foreign subsidiaries that did not generate a tax benefit, which increased our effective tax rate for that prior period.

Segment Results

Segment operating profit for the years ended December 31, 2017 and 2016 is summarized by segment in the following table:

	Year Ended December 31,		
	2017	2016	% Change
(Dollars in millions)			
Operating profit (loss):			
Railroad and Utility Products and Services	$26.2	$54.1	-52 %
Performance Chemicals	71.4	63.5	12 %
Carbon Materials and Chemicals	28.0	(22.6)	224 %
Corporate	(2.0)	(1.6)	-25 %
	$123.6	$93.4	32 %
Operating profit (loss) as a percentage of net sales:			
Railroad and Utility Products and Services	5.1 %	9.2 %	-4.1 %
Performance Chemicals	17.4 %	16.1 %	1.2 %
Carbon Materials and Chemicals	5.1 %	(5.2)%	10.3 %
	8.4 %	6.6 %	1.8 %

Railroad and Utility Products and Services operating profit for the year ended December 31, 2017 decreased by $27.9 million or 52 percent compared to the prior year. Operating profit as a percentage of sales decreased to 5.1 percent from 9.2 percent. Operating profit as a percentage of net sales for the year ended December 31, 2017 was impacted by reduced sales volumes of crossties and railroad services combined with reduced margins in the commercial crosstie market as a result of inventory over-supply in the commercial market. The negative impact from these factors was slightly offset by favorable volumes and sales mix of rail joint products and utility products.

Performance Chemicals operating profit increased by $7.9 million or 12 percent compared to the prior year. Operating profit as a percentage of net sales for PC increased to 17.4 percent from 16.1 percent in the prior year. Operating profit for the year ended December 31, 2017 was positively impacted due primarily to higher North American sales volumes for copper-based wood preservatives. Sales volumes have improved due to favorable market trends in the repair and remodeling markets and existing home sales. Higher sales volumes were also driven primarily by changes in treated wood product application standards in 2016 resulting in treated wood dealers stocking and selling more high retention ground contact treated wood, which moderated in 2017 as dealer inventory has been sufficiently restocked with higher retention treated wood. Although we hedge the majority of our copper purchases, higher copper prices partially offset our increases in sales and operating profit margin for the year ended December 31, 2017.

Carbon Materials and Chemicals operating profit for the year ended December 31, 2017 increased by $50.6 million or 224 percent compared to the prior year. Operating profit as a percentage of net sales for CMC increased to 5.1 percent from a loss of 5.2 percent in the prior year period. Operating profit for the year ended December 31, 2017 was positively affected by lower raw material and shipping costs and higher sales prices in certain regions. In addition to this, in recent quarters there has been an overall tightened market supply of coal tar and carbon pitch in China. This is due to an ongoing shutdown of steel and coking capacity that does not meet environmental and emissions requirements. The pricing for coal tar products in the region has increased significantly and as a result, our recently constructed coal-tar distillation facility serving those markets has a competitive advantage. These positive impacts were partially offset by lower sales volumes in North America and certain costs incurred, such as asset retirement charges, as we continue to consolidate our North American footprint.

Cash Flow

Net cash provided by operating activities was $78.3 million for the year ended December 31, 2018 as compared to net cash provided by operating activities of $101.8 million for the year ended December 31, 2017. The net decrease of $23.5 million in cash provided by operations was due primarily to higher working capital usage of $20.3 million compared to the prior year period principally as a result of an increase in inventory of $18.3 million as one of our Class I railroad customers within RUPS has shifted from a treatment-service only model to having suppliers hold untreated inventory until the crossties have been treated. An additional increase in inventory from CMC is due to higher raw material prices.

Net cash provided by operating activities was $101.8 million for the year ended December 31, 2017 as compared to net cash provided by operating activities of $119.5 million for the year ended December 31, 2016. The net decrease of $17.7 million in cash from operations was due primarily to higher working capital usage compared to the prior year period principally as a result of an increase in accounts receivable in the current year period due to an increase in sales.

Net cash used in investing activities was $376.4 million for the year ended December 31, 2018 as compared to net cash used in investing activities of $56.5 million for the year ended December 31, 2017. The increase in cash used for investing activities of $319.9 million is primarily due to $264.0 million of net cash used for acquisitions as well as incremental current year capital expenditures to expand production capacity at PC in the United States and continued spending on the new naphthalene unit construction at our CMC plant in Stickney, Illinois. Both of these projects were substantially completed by the end of 2018.

Net cash used in investing activities was $56.5 million for the year ended December 31, 2017 as compared to net cash used in investing activities of $53.7 million for the year ended December 31, 2016. The increase in net cash used by investing activities of $2.8 million is primarily due to capital expenditures to expand production capacity at PC in the United States and continued spending on the new naphthalene unit construction at our CMC plant in Stickney, Illinois offset by cash proceeds of $9.5 million from the loan repayment by Tangshan Kailuan Koppers Carbon Chemical Company Limited ("TKK").

Net cash provided by financing activities was $282.8 million for the year ended December 31, 2018 as compared to net cash used in financing activities of $5.9 million for the year ended December 31, 2017. The cash provided by financing activities in the current period reflected net borrowings of $314.6 million to primarily fund acquisitions and capital expenditures and repurchases of common stock of $31.8 million. The cash provided by financing activities in the prior year period reflected net borrowings of revolving credit of $54.3 million and net repayments of long-term debt of $46.7 million, payment of debt issuance costs of $11.0 million from the issuance of new debt and repurchases of common stock of $5.2 million.

Net cash used in financing activities was $5.9 million for the year ended December 31, 2017 as compared to net cash used in financing activities of $62.7 million for the year ended December 31, 2016. The cash provided by financing activities in the current period reflected net borrowings of revolving credit of $54.3 million offset by net repayments of long-term debt of $46.7 million, payment of debt issuance costs of $11.0 million from the issuance of new debt and repurchases of common stock of $5.2 million. The cash used in financing activities in the prior year period reflected net repayments of revolving credit and long-term debt of $29.7 million and $31.7 million, respectively.

Liquidity and Capital Resources

The Company has a $600.0 million senior secured revolving credit facility and a $100.0 million secured term loan (the "Revolving Credit Facility") with a maturity date of April 2023. The interest rate on the Revolving Credit Facility is variable and is based on LIBOR.

Restrictions on Dividends to Koppers Holdings

Koppers Holdings depends on the dividends from the earnings of Koppers Inc. and its subsidiaries to generate the funds necessary to meet its financial obligations, including the payment of any declared dividend of Koppers Holdings. The Revolving Credit Facility prohibits Koppers Inc. from making dividend payments to Koppers Holdings unless (1) such dividend payments are permitted by the indenture governing Koppers Inc.'s $500 million Senior Notes due 2025 (the “2025 Notes”), (2) no event of default or potential default has occurred or is continuing under our Revolving Credit Facility, and (3) we are in pro forma compliance with our fixed charge coverage ratio covenant after giving effect to such dividend. The indenture governing the 2025 Notes restricts Koppers Inc.’s ability to finance our payment of dividends if (1) a default has occurred or would result from such financing, (2) Koppers Inc., or a restricted subsidiary of Koppers Inc. which is not a guarantor under the indenture, is not able to incur additional indebtedness (as defined in the indenture), and (3) the sum of all restricted payments (as defined in the indenture) have exceeded the permitted amount (which we refer to as the “basket”) at such point in time.

The basket is governed by a formula based on the sum of a beginning amount, plus or minus a percentage of Koppers Inc.’s consolidated net income (as defined in the indenture), plus the net proceeds of Koppers Inc.’s qualified stock issuance or conversions of debt to qualified stock, plus the net proceeds from the sale of or a reduction in an investment (as defined in the indenture) or the value of the assets of an unrestricted subsidiary which is designated a restricted subsidiary. At December 31, 2018, the basket totaled $130.2 million. Notwithstanding such restrictions, the indenture governing the 2025 Notes permits an additional aggregate amount of $0.30 per share each fiscal quarter to finance dividends on the capital stock of Koppers Holdings, whether or not there is any basket availability, provided that at the time of such payment, no default in the indenture has occurred or would result from financing the dividends.

In addition, certain required coverage ratios in Koppers Inc.'s Revolving Credit Facility may restrict the ability of Koppers Inc. to pay dividends. Koppers Holdings last declared a dividend in November 2014 and does not expect to declare any dividends for the foreseeable future.

Liquidity

Borrowings under the Revolving Credit Facility are secured by a first priority lien on substantially all of the assets of Koppers Inc., Koppers Holdings and their material domestic subsidiaries. The Revolving Credit Facility contains certain covenants for Koppers Inc. and its restricted subsidiaries that limit capital expenditures, additional indebtedness, liens, dividends and investments or acquisitions. In addition, such covenants give rise to events of default upon the failure by Koppers Inc. and its restricted subsidiaries to meet certain financial ratios.

As of December 31, 2018, we had $179.0 million of unused revolving credit availability for working capital purposes after restrictions by various debt covenants and certain letter of credit commitments. As of December 31, 2018, $31.9 million of commitments were utilized by outstanding letters of credit.

The following table summarizes our estimated liquidity as of December 31, 2018 (dollars in millions):

Cash and cash equivalents[1]	$40.6
Amount available under revolving credit facility	179.0
Total estimated liquidity	$219.6

(1) Cash includes approximately $36.9 million held by foreign subsidiaries.
Our estimated liquidity was $263.6 million at December 31, 2017.

Our remaining need for cash in the next twelve months relates primarily to contractual obligations which include debt service, purchase commitments and operating leases, as well as working capital, capital maintenance programs, liability transfers of closed facilities and the funding of plant consolidation and rationalizations. We may also use cash to pursue other potential strategic acquisitions or voluntary pension plan contributions. Capital expenditures in 2019, excluding acquisitions, if any, are expected to total approximately $30 million and are expected to be funded by cash from operations.

Schedule of Certain Contractual Obligations

The following table details our projected payments for our significant contractual obligations as of December 31, 2018. The table is based upon available information and certain assumptions we believe to be reasonable.

	Payments Due by Period				
	2019	2020-2021	2022-2023	Later years	Total
(in millions)					
Long-term debt [1]	$11.6	$ 38.4	$ 452.6	$ 500.0	$1,002.6
Interest on debt	57.6	111.7	60.0	30.0	259.3
Operating leases	30.3	41.9	25.9	36.0	134.1
Federal tax payments [2]	0.8	0.8	1.8	1.3	4.7
Purchase commitments [3]	180.7	247.1	203.6	256.1	887.5
Total contractual cash obligations	$281.0	$ 439.9	$ 743.9	$ 823.4	$2,288.2

(1) Consists primarily of the maturity of the Senior Notes due 2025 and Revolving Credit Facility that will mature in 2023.
(2) Relates to the transition tax in accordance with the Tax Act.
(3) Consists primarily of raw materials purchase contracts. These are typically not fixed price arrangements; the prices are based on the prevailing market prices. As a result, we generally expect to be able to hedge the purchases with sales at those future prices.

Pension and other employee benefit plan funding obligations (for defined benefit plans) are not included in the table above. We expect defined benefit plan contributions to total approximately $3.6 million in 2019. Estimated funding obligations are determined by asset performance, workforce and retiree demographics, tax and employment laws and other actuarial assumptions which may change the annual funding obligations in addition to decisions to fund in excess of statutorily required amounts. The funded status of our defined benefit plans is disclosed in Note 15 in our consolidated financial statements.

As of December 31, 2018, there was $7.0 million of tax liabilities related to unrecognized tax benefits. Because of the high degree of uncertainty regarding the timing of future cash outflows associated with these liabilities, we are unable to estimate the years in which settlement will occur with the respective taxing authorities. See Note 10 in our consolidated financial statements for further information.

Schedule of Certain Other Commercial Commitments

The following table details our projected payments for other significant commercial commitments as of December 31, 2018. The table is based upon available information and certain assumptions we believe to be reasonable.

	Amount of Commitment Expiration Per Period				
	2019	2020-2021	2022-2023	Later years	Total Amounts Committed
(in millions)					
Lines of credit (unused)	$0.0	$ 0.0	$ 390.0	$ 0.0	$ 390.0
Term Loan	10.0	20.0	62.5	0.0	92.5
Standby letters of credit	31.9	0.0	0.0	0.0	31.9
Total other commercial commitments	$41.9	$ 20.0	$ 452.5	$ 0.0	$ 514.4

Debt Covenants at December 31, 2018

The covenants that affect availability of the Revolving Credit Facility and which may restrict the ability of Koppers Inc. to pay dividends include the following financial ratios:

- The fixed charge coverage ratio, calculated as of the end of each fiscal quarter for the four fiscal quarters then ended, is not permitted to be less than 1.10. The fixed charge coverage ratio at December 31, 2018 was 1.35.
- The senior secured leverage ratio, calculated as of the end of each fiscal quarter for the four fiscal quarters then ended, is not permitted to exceed 3.25. The leverage ratio at December 31, 2018 was 2.39.
- The total leverage ratio, calculated as of the end of each fiscal quarter for the four fiscal quarters then ended, is not permitted to exceed 5.50. The leverage ratio at December 31, 2018 was 4.73.

We are currently in compliance with all covenants governing the Revolving Credit Facility. Our continued ability to meet those financial ratios can be affected by events beyond our control, however, excluding possible acquisitions, we currently expect that our net cash flows from operating activities and funds available from our Revolving Credit Facility will be sufficient to provide for our working capital needs and capital spending requirements over the next twelve months.

Other Matters

Foreign Operations and Foreign Currency Transactions

We are subject to foreign currency translation fluctuations due to our foreign operations. For the years ended December 31, 2018, 2017 and 2016, exchange rate fluctuations resulted in a decrease to comprehensive income of $25.6 million, an increase of $17.0 million and a decrease of $4.3 million, respectively. Foreign currency transaction gains and losses result from transactions denominated in a currency which is different from the currency used by the entity to prepare its financial statements. Foreign currency transaction gains (losses) were $0.6 million, $(2.3) million and $(1.3) million for the years ended December 31, 2018, 2017 and 2016, respectively.

Recently Issued Accounting Guidance

Information regarding recently issued accounting guidance is contained in Note 3 “New Accounting Pronouncements” of the Notes to the Consolidated Financial Statements.

Critical Accounting Policies

The preparation of financial statements in conformity with generally accepted accounting principles in the United States requires management to use judgment in making estimates and assumptions that affect the reported amounts of revenues and expenses, assets and liabilities, and the disclosure of contingent liabilities. The following accounting policies are based on, among other things, judgments and assumptions made by management that include inherent risks and uncertainties. Our management’s estimates are based on the relevant information available at the end of each period.

Revenue Recognition. We recognize revenue upon the completion of performance obligations under contracts with our customers and when control of a good or service is transferred to the customer. Substantially all of our contracts with our customers are ship and invoice arrangements where revenue is recognized when we complete our performance obligations and transfer control to the customer. We also have certain arrangements where revenue is recognized under the contract where control of the goods or services had been transferred to the customer prior to shipment. Revenue recognition generally occurs at the point of shipment; however in certain circumstances as shipping terms dictate, we transfer control and revenue is recognized at the point of destination. Shipping and handling costs are included as a component of cost of sales.

We also recognize revenue related to the procurement of certain untreated railroad crossties upon delivery to our plant and acceptance by the customer. Service revenue, consisting primarily of wood treating services, is recognized at the time the service is provided and the performance obligation is satisfied.

Goodwill and Intangible Assets. Goodwill is not amortized but is assessed for impairment at least on an annual basis in the fourth quarter and whenever events or circumstances indicate the carrying value may not be recoverable. In making this assessment, management relies on various factors, including operating results, estimated future cash flows, and business plans. There are inherent uncertainties related to these factors and in our management's judgment in applying them to the analysis of goodwill impairment. Because management's judgment is involved in performing goodwill impairment analyses, there is risk that the carrying value of goodwill is overstated.

Goodwill valuations are performed using projected operating results of the relevant reporting units. We have three reporting units for purposes of goodwill evaluation. These units consist of our PC operating segment, our Railroad Products and Services reporting unit and our Utility Products reporting unit. Railroad Products and Services and Utility Products are one level below our RUPS operating segment. The Railroad Products and Services reporting unit primarily serves the rail industry in the United States and the Utility Products reporting unit serves the utility industries in the United States and Australia.

Goodwill remaining on our consolidated balance sheet at December 31, 2018 is $296.5 million. We determined that no impairment of goodwill at any of our reporting units was required as of December 31, 2018.

Identifiable intangible assets are valued at fair value upon the acquisition of a business. Identifiable intangible assets that do not have indefinite lives are amortized on a straight-line basis over their estimated useful lives. We have identifiable intangible assets of $188.0 million as of December 31, 2018. We annually evaluate the remaining useful life of the intangible asset being amortized to determine whether events or circumstances warrant a revision to the remaining period of amortization. If the estimate of an intangible asset's remaining useful life is changed, the remaining carrying amount of the intangible asset will be amortized prospectively over that revised remaining useful life. Identifiable intangible assets are also subject to testing for recoverability whenever events or changes indicate that its carrying value may not be recoverable.

Changes in economic and operating conditions impacting these assumptions could result in goodwill and intangible asset impairments in future periods. Additionally, disruptions to our business such as prolonged recessionary periods or unexpected significant declines in operating results of the relevant reporting units could result in charges for goodwill and other asset impairments in future periods.

Deferred Tax Assets. At December 31, 2018 our balance sheet included $15.5 million of deferred tax assets, which is net of a $59.9 million valuation allowance. We also had $6.8 million of deferred tax liabilities resulting in net deferred tax assets of $8.7 million, substantially all related to our domestic entities. In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will be realized. In evaluating the need for a valuation allowance, management considers various factors, including the expected level of future taxable income, available tax planning strategies and reversals of existing taxable temporary differences.

The realization of a majority of the Company's deferred tax assets is not subject to any expiration and is dependent upon the reversal of the underlying temporary differences. To the extent future taxable income projections are not achieved, we could be required to record a valuation allowance against certain deferred tax assets. Item 8. Financial Statements and Supplementary Data – Note 10 includes information on deferred tax activity during the past two years.

Asset Retirement Obligations. We measure asset retirement obligations based upon the applicable accounting guidance, using certain assumptions including estimates regarding the recovery of residues in storage tanks. In the event that operational or regulatory issues vary from our estimates, we could incur additional significant charges to income and increases in cash expenditures related to the disposal of those residues. Certain conditional asset retirement obligations related to facilities have not been recorded in the consolidated financial statements due to uncertainties surrounding the ultimate settlement date and estimate of fair value related to a legal obligation to perform an asset retirement activity. At the date a reasonable estimate of the ultimate settlement can be made, we will record an asset retirement obligation and such amounts may be material to the consolidated financial statements in the period in which they are recorded. In 2018, we recorded additional asset retirement obligations of $0.8 million principally related to the retirement of water containment systems and storage tank and railcar cleaning costs in the United States. Item 8. Financial Statements and Supplementary Data – Note 2 includes information on expense recognized during the past two years.

Pension and Postretirement Benefits. Accounting for pension and other postretirement benefit obligations involves numerous assumptions, the most significant of which relate to the following:

- the discount rate for measuring the present value of future plan obligations;
- the expected long-term return on plan assets;

We develop our demographics and utilize the work of third-party actuaries to assist in the measurement of these obligations. We have selected different discount rates for our pension plans and our other post-retirement benefit plans due to the different projected benefit payment patterns. In determining the assumed discount rates at December 31, 2018, we use our third-party actuary's discount rate model. This model calculates an equivalent single discount rate for the projected benefit plan cash flows using a hypothetical bond portfolio to match expected cash flows under our benefit plans. The bonds used are rated AA or higher by a recognized rating agency and only non-callable bonds are included with the exception of those with a "make-whole call" feature. The actuary limited the selection to those bonds with a minimum of 100,000 outstanding issues. Outlier bonds whose yields exceeded two standard deviations from the yield curve derived from similar quality bonds were excluded.

Of the assumptions used to measure the year-end obligations and estimated annual net periodic benefit cost, the discount rate has the most significant effect on the periodic benefit cost reported for the plans. Decreasing the discount rates by 0.25 percent for our pension plans and 0.25 percent for our other postretirement benefit plans would increase pension obligations and other postretirement benefit plan obligations by $4.4 million and would increase defined benefit pension expense and other postretirement benefit plan expense by $0.3 million.

The asset rate of return assumption considers the asset mix of the plans (currently targeted at approximately 30 to 40 percent equity securities and 60 to 70 percent fixed income securities for the funded pension plans), past performance and other factors, including expected re-allocations of asset mix occurring within a reasonable period of time. Our asset rate of return assumption is 4.83 percent for 2018 defined benefit pension expense. Decreasing the 4.83 percent asset rate of return assumption by 0.25 percent would increase our defined benefit pension expense by $0.4 million.

Item 8. Financial Statements and Supplementary Data – Note 15 includes detailed information about the assumptions used to calculate the components of our annual defined benefit pension and other postretirement plan expense, as well as the obligations and accumulated other comprehensive loss reported on the year-end balance sheets.

Environmental Liabilities. We are subject to federal, state, local and foreign laws and regulations and potential liabilities relating to the protection of the environment and human health and safety, including, among other things, the cleanup of contaminated sites, the treatment, storage and disposal of wastes, the discharge of effluent into waterways, the emission of substances into the air and various health and safety matters. We expect to incur substantial costs for ongoing compliance with such laws and regulations. We may also incur costs as a result of governmental or third-party claims, or otherwise incur costs, relating to cleanup of, or for injuries resulting from, contamination at sites associated with past and present operations. We accrue for environmental liabilities when a determination can be made that they are probable and reasonably estimable. Item 8. Financial Statements and Supplementary Data – Note 20 includes information about environmental liabilities.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Like other global companies, we are exposed to market risks relating to fluctuations in commodity prices, interest rates and foreign currency exchange rates. The objective of our financial risk management is to minimize the negative impact of commodity price, interest rate and foreign exchange rate fluctuations on our earnings, cash flows and equity.

To manage commodity price risk, we enter into swap contracts for future forecasted purchases of copper. This reduces the impact of commodity price volatility on gross profit. To manage the interest rate risks, we use a combination of fixed and variable rate debt. This reduces the impact of short-term fluctuations in interest rates. To manage foreign currency exchange rate risks, we use forward exchange contracts to hedge firm commitments up to twelve months and all such contracts are marked to market with the recognition of a gain or loss at each reporting period.

The following analyses present the sensitivity of the market value, earnings and cash flows of our financial instruments and foreign operations to hypothetical changes in interest and exchange rates and market prices for copper as if these changes occurred at December 31, 2018. The range of changes chosen for these analyses reflects our view of changes which are reasonably possible over a one-year period. Market values are the present values of projected future cash flows based on the interest rate, exchange rate and copper price assumptions. These forward-looking statements are selective in nature and only address the potential impacts from financial instruments and foreign operations. They do not include other potential effects that could impact our business as a result of these changes.

Commodity Price Sensitivity Analysis. Our exposure to market risk for changes in copper prices relates primarily to the purchase price of the raw material and the fixed price sales agreements we have with customers of our PC segment. We utilize swap contracts to manage this price risk. As of December 31, 2018, we had outstanding copper swap contracts totaling 48.8 million pounds and the fair value of these contracts resulted in a loss of $9.2 million. A portion of the loss totaling $6.8 million, before tax, is recognized in other comprehensive income and a portion of the loss totaling $2.4 million is recognized in income, before tax. Holding other variables constant, if there were a 10 percent reduction in the December 31, 2018 market price of copper, the fair value of these contracts would be a loss of $22.5 million. This hypothetical loss would be allocated $16.5 million to other comprehensive income and $6.0 million would be recognized in income, before tax.

Interest Rate and Debt Sensitivity Analysis. Our exposure to market risk for changes in interest rates relates primarily to our debt obligations. We have fixed and variable rate debt and the ability to incur variable rate debt under the Koppers Inc. credit agreement.

At December 31, 2018 we had $500.0 million of fixed rate debt and $490.4 million of variable rate debt. Our ratio of fixed rate debt to variable rate debt at December 31, 2018 was approximately 102 percent. For fixed rate debt, interest rate changes affect the fair market value but do not impact earnings or cash flows. For variable rate debt, interest rate changes generally do not affect the fair market value but do impact future earnings and cash flows, assuming other factors are held constant.

Holding other variables constant (such as debt levels and foreign exchange rates), a one percentage point decrease in interest rates at December 31, 2018 would have increased the unrealized fair market value of the fixed rate debt by approximately $5.2 million. The earnings and cash flows for the year ending December 31, 2018, assuming a one percentage point increase in interest rates, would have decreased approximately $4.9 million, holding other variables constant for variable rate debt.

Exchange Rate Sensitivity Analysis. Our exchange rate exposures result primarily from our investment and ongoing operations in Australia, Canada, China, Denmark, the Netherlands, New Zealand, and the United Kingdom. Holding other variables constant, if there were a ten percent reduction in all relevant exchange rates, the effect on our earnings, based on actual earnings from foreign operations for the year ended December 31, 2018, would be a reduction of approximately $7.9 million.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Koppers Holdings Inc.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

The management of Koppers Holdings Inc. is responsible for establishing and maintaining adequate internal control over financial reporting. 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 reporting purposes in accordance with accounting principles generally accepted in the United States of America.

Management has excluded Koppers Utility and Industrial Products Inc. ("UIP") and Koppers Recovery Resources LLC ("KRR") from its assessment of internal controls over financial reporting as of December 31, 2018 its acquisitions of UIP and KRR effective April 10, 2018 and February 28, 2018, respectively. UIP and KRR are wholly-owned subsidiaries and their combined total assets of $275.0 million and total revenues of $163.0 million are included in the consolidated financial statements of Koppers Holdings Inc. as of and for the year ended December 31, 2018.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Management has assessed the effectiveness of Koppers Holdings Inc.'s internal control over financial reporting as of December 31, 2018. In making this assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control – Integrated Framework (2013 Framework). Management concluded that based on its assessment, Koppers Holdings Inc.'s internal control over financial reporting was effective as of December 31, 2018.

The effectiveness of Koppers Holdings Inc.'s internal control over financial reporting as of December 31, 2018, has been audited by KPMG LLP, the independent registered public accounting firm that also audited the consolidated financial statements included in this annual report, as stated in their attestation report which appears on page 43.

March 1, 2019

/S/ LEROY M. BALL
Leroy M. Ball
President and Chief Executive Officer

/S/ MICHAEL J. ZUGAY
Michael J. Zugay
Chief Financial Officer and Treasurer

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Koppers Holdings Inc.:

Opinion on Internal Control Over Financial Reporting

We have audited Koppers Holdings Inc. and 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, the Company maintained, in all material respects, 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 operations, comprehensive (loss) income, shareholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes and the financial statement schedule listed in the Index at Item 15(a)2 (collectively, the "consolidated financial statements"), and our report dated March 1, 2019 expressed an unqualified opinion on those consolidated financial statements.

The Company acquired Koppers Utility and Industrial Products ("UIP") and Koppers Recovery Resources LLC ("KRR") during 2018, and management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2018, UIP and KRR's internal controls over financial reporting associated with total assets of $275 million and total revenues of $163 million included in the consolidated financial statements of the Company as of and for the year ended December 31, 2018. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of UIP and KRR.

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

Pittsburgh, Pennsylvania
March 1, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Koppers Holdings Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Koppers Holdings Inc. and subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive (loss) income, cash flows, and shareholders' equity for each of the years in the three year period ended December 31, 2018, and the related notes and financial statement schedule listed in the Index at Item 15(a)2 (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 March 1, 2019 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

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 2016.

Pittsburgh, Pennsylvania
March 1, 2019

KOPPERS HOLDINGS INC.

CONSOLIDATED STATEMENT OF OPERATIONS

	Year Ended December 31,		
	2018	2017	2016
(Dollars in millions, except per share amounts)			
Net sales	$1,710.2	$1,475.5	$1,416.2
Cost of sales	1,375.1	1,153.4	1,126.2
Depreciation and amortization	50.8	49.8	52.9
Loss (gain) on sale of assets	8.3	0.0	(2.1)
Impairment and restructuring charges	4.0	16.2	20.1
Selling, general and administrative expenses	161.6	132.5	125.7
Operating profit	110.4	123.6	93.4
Other income, net	0.7	2.5	0.3
Interest expense	56.3	42.5	50.8
Loss on pension settlements	0.0	10.0	4.4
Loss on extinguishment of debt	0.0	13.3	0.0
Income before income taxes	54.8	60.3	38.5
Income tax provision	26.0	29.0	11.4
Income from continuing operations	28.8	31.3	27.1
Income (loss) from discontinued operations, net of tax (expense) benefit of $(0.4), $0.2 and $(0.3)	0.4	(0.8)	0.6
Net income	29.2	30.5	27.7
Net income (loss) attributable to noncontrolling interests	5.8	1.4	(1.6)
Net income attributable to Koppers	$23.4	$29.1	$29.3
Earnings (loss) per common share attributable to Koppers common shareholders:			
Basic -			
Continuing operations	$1.10	$1.44	$1.39
Discontinued operations	0.02	(0.04)	0.03
Earnings per basic common share	$1.12	$1.40	$1.42
Diluted -			
Continuing operations	$1.08	$1.36	$1.36
Discontinued operations	0.02	(0.04)	0.03
Earnings per diluted common share	$1.10	$1.32	$1.39
Weighted average shares outstanding (in thousands):			
Basic	20,871	20,754	20,636
Diluted	21,326	22,000	21,055

KOPPERS HOLDINGS INC.

CONSOLIDATED STATEMENT OF COMPREHENSIVE (LOSS) INCOME

	Year Ended December 31,		
	2018	2017	2016
(Dollars in millions)			
Net income	$29.2	$30.5	$27.7
Changes in other comprehensive income:			
Currency translation adjustment	(25.6)	17.0	(4.3)
Unrealized (loss) gain on cash flow hedges, net of tax benefit (expense) of $10.0, $(3.5) and $(8.0)	(25.2)	6.1	12.9
Change in accounting standard	0.3	0.0	0.0
Unrecognized pension prior service benefit, net of tax benefit of $0.1, $0.0 and $0.0	(0.6)	0.0	0.0
Unrecognized pension net (loss) gain, net of tax benefit (expense) of $0.2, $(2.8) and $(2.0)	(0.5)	8.8	2.3
Total comprehensive (loss) income	(22.4)	62.4	38.6
Comprehensive income (loss) attributable to noncontrolling interests	5.0	1.7	(1.9)
Comprehensive (loss) income attributable to Koppers	$(27.4)	$60.7	$40.5

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

KOPPERS HOLDINGS INC.

CONSOLIDATED BALANCE SHEET

	December 31, 2018	2017
(Dollars in millions, except per share amounts)		
Assets		
Cash and cash equivalents	$40.6	$60.3
Accounts receivable, net of allowance of $2.5 and $2.5	189.7	159.2
Income tax receivable	2.8	1.7
Inventories, net	284.7	236.9
Other current assets	22.5	48.6
Total current assets	540.3	506.7
Property, plant and equipment, net	417.9	328.0
Goodwill	296.5	188.2
Intangible assets, net	188.0	129.6
Deferred tax assets	15.5	18.4
Other assets	21.7	29.3
Total assets	$1,479.9	$1,200.2
Liabilities		
Accounts payable	$177.2	$141.9
Accrued liabilities	109.9	127.9
Current maturities of long-term debt	11.6	11.4
Total current liabilities	298.7	281.2
Long-term debt	978.8	665.6
Accrued postretirement benefits	48.2	46.3
Deferred tax liabilities	6.8	7.3
Other long-term liabilities		