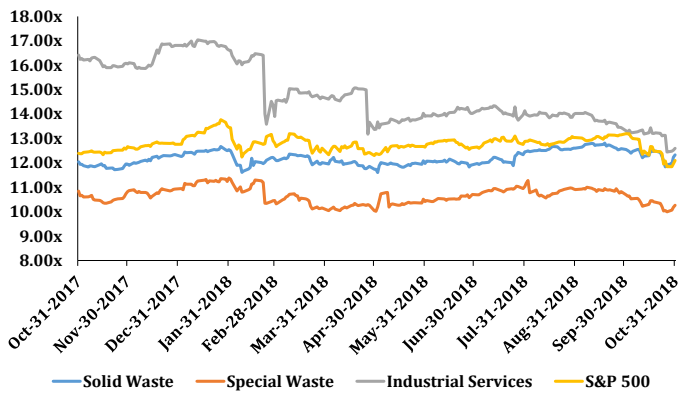


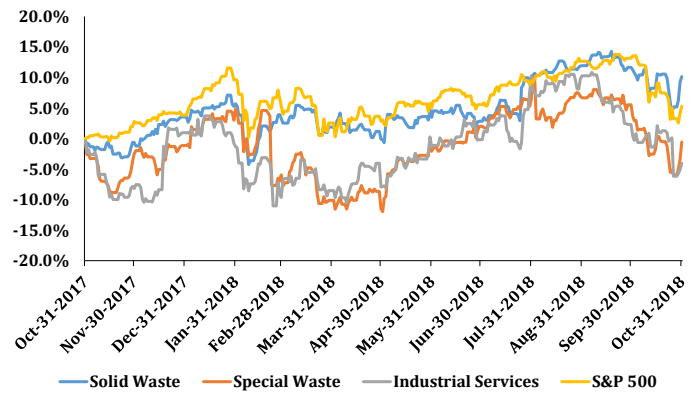
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Environmental Services LTM TEV/EBITDA



Environmental Services LTM Share Price (Shown as % change)



Indices Performance (% change)

	October 2018	LTM		October 2018	LTM
S&P 500	(7.3%)	5.3%	Solid Waste	(1.4%)	10.2%
Dow Jones	(5.8%)	7.4%	Special Waste	(5.8%)	(0.6%)
NASDAQ	(9.1%)	8.6%	Industrial Services	(6.2%)	(4.0%)

(Source: CapitalIQ)

Largest Environmental Services Movers and Losers (largest % changes in the month of October)

Heritage-Crystal Clean, Inc	7.7%	Stericycle, Inc.	(14.8%)
Darling Ingredients Inc.	6.9%	Quest Resource Holding Corporation	(10.9%)
Casella Waste Systems, Inc.	4.8%	Perma-Fix Environmental Services, Inc.	(10.2%)
Sharps Compliance Corp.	4.1%	Industrial Services of America, Inc.	(9.8%)
Advanced Disposal Services, Inc.	0.0%	Covanta Holding Corporation	(9.6%)

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Select Public Trading Statistics (as of 10/31/2018)

Solid Waste:

(\$ in millions, except per share data)

Company	Share Price 10/31/2018	% of 52 Wk High	Market Capitalization	Enterprise Value	Valuation Multiples			PE Multiples			LTM Operating Margins			Net Debt/EBITDA	
					TEV/Total Revenue	TEV/EBITDA	TEV/EBIT	LTM P/E	CY18 P/E	CY19 P/E	Gross	EBIT	EBITDA		
Waste Management, Inc.	WM	\$89.47	96.4%	\$38,145	\$48,080	3.3x	11.7x	18.2x	16.9x	22.9x	21.4x	38.0%	18.3%	28.1%	2.4x
Republic Services, Inc.	BSG	\$72.68	95.9%	\$23,990	\$31,761	3.2x	11.4x	19.2x	17.2x	24.0x	22.5x	38.3%	16.6%	27.8%	2.9x
Waste Connections, Inc.	WCN	\$76.44	94.0%	\$20,142	\$23,660	4.9x	15.5x	27.5x	27.7x	33.8x	29.8x	41.8%	17.9%	31.6%	2.3x
Advanced Disposal Services, Inc.	ADSW	\$27.09	97.0%	\$2,402	\$4,283	2.8x	11.1x	44.3x	49.7x	49.4x	44.4x	35.0%	6.0%	24.7%	4.9x
Casella Waste Systems, Inc.	CWST	\$32.56	95.9%	\$1,392	\$1,894	3.0x	16.5x	38.4x	46.1x	48.2x	37.0x	31.6%	7.9%	18.5%	4.4x
Mean				\$17,134	\$21,936	3.4x	13.2x	29.5x	31.5x	35.6x	31.0x	36.9%	13.3%	26.2%	3.4x
Median				\$20,142	\$23,660	3.2x	11.7x	27.5x	27.7x	33.8x	29.8x	38.0%	16.6%	27.8%	2.9x
High				\$38,145	\$48,080	4.9x	16.5x	44.3x	49.7x	49.4x	44.4x	41.8%	18.3%	31.6%	4.9x
Low				\$1,392	\$1,894	2.8x	11.1x	18.2x	16.9x	22.9x	21.4x	31.6%	6.0%	18.5%	2.3x

Source: Capital IQ

Total Enterprise Value (TEV) = Market Capitalization + Preferred Equity + Debt + Minority Interest - Cash

LTM = Last Twelve Months

Special Waste:

(\$ in millions, except per share data)

Company	Share Price 10/31/2018	% of 52 Wk High	Market Capitalization	Enterprise Value	Valuation Multiples			PE Multiples			LTM Operating Margins			Net Debt/EBITDA	
					TEV/Total Revenue	TEV/EBITDA	TEV/EBIT	LTM P/E	CY18 P/E	CY19 P/E	Gross	EBIT	EBITDA		
Stortecycle, Inc.	SREL	\$49.97	65.1%	\$4,292	\$6,013	1.9x	10.1x	16.3x	25.9x	14.6x	14.9x	39.6%	9.8%	17.3%	4.6x
Clean Harbors, Inc.	CLH	\$68.04	93.8%	\$3,811	\$5,181	1.6x	11.1x	29.6x	28.9x	NM	NM	29.9%	5.5%	14.7%	2.9x
Darling Ingredients, Inc.	DAR	\$20.66	98.6%	\$3,402	\$5,068	1.4x	8.7x	18.9x	19.1x	62.6x	22.7x	21.8%	3.4%	12.5%	3.7x
US Ecology, Inc.	ECOL	\$69.93	90.6%	\$1,533	\$1,757	3.3x	15.3x	23.6x	25.0x	30.5x	26.2x	31.7%	15.3%	22.7%	2.0x
Shups Compliance Corp.	SMED	\$3.59	69.7%	\$58	\$54	1.3x	NM	NM	NM	NM	NM	28.8%	(1.4%)	2.5%	(3.3x)
Perma-Fix Environmental Services, Inc.	PESI	\$3.77	73.2%	\$45	\$45	0.9x	23.1x	NM	NM	NM	NM	24.1%	0.7%	3.8%	1.9x
Mean				\$2,190	\$3,170	1.8x	13.6x	22.1x	24.7x	35.9x	21.3x	29.3%	5.6%	12.2%	2.0x
Median				\$2,467	\$3,412	1.5x	11.1x	21.3x	25.5x	30.5x	22.7x	29.3%	4.5%	13.6%	2.5x
High				\$4,292	\$6,913	3.3x	23.1x	29.6x	28.9x	62.6x	26.2x	39.6%	15.3%	22.7%	4.6x
Low				\$45	\$45	0.9x	8.7x	16.3x	19.1x	14.6x	14.9x	21.8%	-1.4%	2.5%	(3.3x)

Source: Capital IQ

Total Enterprise Value (TEV) = Market Capitalization + Preferred Equity + Debt + Minority Interest - Cash

LTM = Last Twelve Months

Industrial Services:

(\$ in millions, except per share data)

Company	Share Price 10/31/2018	% of 52 Wk High	Market Capitalization	Enterprise Value	Valuation Multiples			PE Multiples			LTM Operating Margins			Net Debt/EBITDA	
					TEV/Total Revenue	TEV/EBITDA	TEV/EBIT	LTM P/E	CY18 P/E	CY19 P/E	Gross	EBIT	EBITDA		
Covanta Holding Corporation	CVA	\$14.69	81.4%	\$1,904	\$4,347	2.3x	12.6x	35.6x	7.1x	NM	NM	31.1%	6.4%	18.3%	7.2x
Heritage-Crystal Clean, Inc.	HCCI	\$22.99	91.2%	\$530	\$513	1.3x	11.9x	19.3x	22.4x	38.5x	22.9x	22.6%	6.7%	10.8%	(0.4x)
CECO Environmental Corp.	CECE	\$7.44	81.0%	\$260	\$310	1.0x	14.0x	42.9x	NM	31.0x	19.4x	34.1%	3.0%	7.5%	2.2x
Cypress Energy Partners, L.P.	CELP	\$7.10	83.5%	\$85	\$172	0.6x	10.1x	14.7x	10.3x	21.3x	NM	14.0%	4.9%	6.8%	3.2x
Ecology & Environment, Inc.	EEL	\$12.90	89.3%	\$56	\$41	0.4x	7.6x	9.5x	26.1x	NM	NM	44.7%	4.1%	5.1%	(3.0x)
Quest Resource Holding Corporation	QRHC	\$2.28	73.5%	\$35	\$39	0.4x	NM	NM	NM	NM	NM	15.3%	(3.9%)	(0.4x)	(8.9x)
Fuel Tech, Inc.	FTEK	\$1.20	65.6%	\$29	\$25	0.5x	NM	NM	NM	NM	NM	36.6%	0.0%	1.8%	(4.4x)
Industrial Services of America, Inc.	ISDA	\$2.03	75.2%	\$16	\$25	0.4x	8.5x	28.3x	50.0x	NM	NM	6.6%	1.0%	4.4%	3.0x
Mean				\$364	\$684	0.9x	10.8x	25.1x	23.2x	30.3x	21.1x	25.6%	2.8%	6.8%	-0.1x
Median				\$70	\$107	0.5x	11.0x	23.8x	22.4x	31.0x	21.1x	26.9%	3.6%	5.9%	0.9x
High				\$1,904	\$4,347	2.3x	14.0x	42.9x	50.0x	38.5x	22.9x	44.7%	6.7%	18.3%	7.2x
Low				\$16	\$25	0.4x	7.6x	9.5x	7.1x	21.3x	19.4x	6.6%	-3.9%	-0.4x	(8.9x)

Source: Capital IQ

Total Enterprise Value (TEV) = Market Capitalization + Preferred Equity + Debt + Minority Interest - Cash

LTM = Last Twelve Months





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Select Mergers and Acquisitions & Capital Raising News

❖ Meridian Waste Acquires Florida-based Partner Disposal

October 1, 2018 – Meridian Waste, a non-hazardous solid waste services company, announced its asset acquisition of Partner Disposal located in the Jacksonville, Florida, marketplace. This transaction comes on the heels of Nassau County approving Meridian Waste for a commercial and residential hauler's permit earlier this month. Meridian Waste will now provide environmental waste services to approximately 300 new commercial customers and 3,500 new residential customers and operate from two North Florida facilities, including Partner Disposal's existing location in Yulee, Florida, and the company's new Jacksonville commercial hauling location. New Meridian Waste customers will still benefit from Partner Disposal's staff, as all employees are joining the Meridian Waste team, including Partner Disposal Founder and Owner Dave Shepler. Communications will begin to come from Meridian Waste. The company encourages customers to sign up for service alerts to be notified by email and/or text of issues such as severe weather events, road closures and holidays affecting their collection schedule. Upon Jacksonville-based private equity firm, Warren Equity Partners, taking Meridian Waste private in April, the company has expanded outside its previous core operations in the St. Louis, Missouri, and Richmond, Virginia, marketplaces into new service areas in Augusta and Macon, Georgia, and now Northeast Florida. The company noted it will continue to grow as it identifies and executes upon strategic acquisitions, local government contracting opportunities and organic growth through sales and service.

❖ Energy Capital Partners Signs Agreement to Sell Wheelabrator

October 3, 2018 – Energy Capital Partners (ECP) has entered into a definitive agreement to sell Wheelabrator Technologies Inc., an owner and operator of waste-to-energy (WTE) facilities, to Macquarie Infrastructure Partners (MIP), which operates within the Macquarie Infrastructure and Real Assets (MIRA) division of Macquarie Group. MIP will make the investment through one of its managed funds. Wheelabrator provides a waste disposal solution for local communities and delivers renewable energy to residential and commercial consumers. Wheelabrator currently has a platform of 26 assets in the U.S. and the U.K., including 19 WTE facilities (three under construction), three independent power plants and four ash monofills. The transaction is subject to Federal Energy Regulatory Commission, Committee on Foreign Investment in the United States, Federal Communications Commission and New Jersey Department of Environmental Protection approvals and other customary closing conditions. It is expected to close in the first quarter of 2019.

❖ Casella Acquires WeCare Waste & Recycling and Valley Sanitation

October 5, 2018 – Casella Waste Systems, Inc., a regional vertically integrated solid waste, recycling and resource management services company, announced it has acquired the assets of WeCare Waste & Recycling, LLC and Valley Sanitation. Both transactions closed on October 1. WeCare is a provider of residential, commercial and roll-off collection services in the Geneva, New York, and Ithaca, New York, marketplaces. Valley is a provider of residential and commercial collection services in the Plattsburgh, New York, marketplace. In total, Casella said it expects to generate approximately \$5 million of annualized revenue from the WeCare and Valley acquisitions.

❖ Lakeshore Recycling Systems Acquires Royal Container Service

October 8, 2018 – Lakeshore Recycling Systems (LRS), an independent recycling and waste diversion provider in the Midwest, announced it has acquired Madison, Wisconsin-based Royal Container Service, a dumpster and recycling services provider. The acquisition creates a scalable waste and recycling platform in southern Wisconsin and expands the LRS service area. Financial terms were not disclosed, and the acquisition is effective immediately. As a result of the acquisition, Royal's 50 employees, 25 trucks and more than 1,000 roll-off dumpsters will now be a part of LRS. The company also will control three key facilities previously owned by Royal located in Madison and its surrounding communities, including one of the few automated construction and demolition (C&D) recycling facilities in Wisconsin. Royal controls nearly 100,000 tons of material and successfully recycles or diverts in excess of 75 percent of that material.

❖ GFL Environmental, Waste Industries Announce Merger

October 10, 2018 – GFL Environmental Inc. (GFL) and Waste Industries announced that they have entered into a definitive merger agreement in a transaction that values Waste Industries at a total enterprise value of \$2.825 billion (approximately C\$3.65 billion). The transaction, which is expected to close in the fourth quarter of 2018, is subject to customary regulatory approvals. Following its recapitalization completed in May with a consortium led by affiliates of BC Partners and including affiliates of Ontario Teachers' Pension Plan and others, GFL is one of the largest environmental services companies in North America. Since its founding by the Poole family in 1970, Waste Industries has grown to become an independent, vertically integrated solid waste management company in the Southeastern United States. When combined with GFL's existing solid waste operations, GFL and Waste Industries will become the largest privately owned environmental services company in North America with operations in all Canadian provinces except Prince Edward Island and in 10 states in the United States. The combined company will operate 98 collection operations, 59 transfer stations, 29 materials recovery facilities, 10 organics facilities and 47 landfills and will have more than 8,850 employees. Patrick Dovigi will continue to be the president and CEO of the combined company. Certain shareholders, including the founding Poole family, and members of management are contributing committed capital and are expected to become shareholders of GFL in connection with the transaction. Poole will also join GFL's board of directors and serve as a senior vice president of the combined company upon closing of the transaction. BC Partners, Ontario Teachers and some of GFL's other shareholders, including Dovigi, are providing new equity financing for the transaction. In addition, Barclays, Bank of Montreal, BMO Capital Markets Corp. and Royal Bank of Canada are providing committed debt financing. GFL expects the debt financing to consist of

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secured and unsecured debt, which will be used to fund a portion of the purchase price and to repay existing Waste Industries indebtedness. GFL also announced that Luke Pelosi has been appointed CFO to replace David Bacon. On the closing of the merger, Greg Yorston will take on the role of COO for all of GFL's solid waste operations in Canada and the United States.

❖ Amazon Invests \$10M in Closed Loop Fund to Support Recycling

October 17, 2018 – Amazon just announced that it will invest \$10 million in Closed Loop Fund to support recycling infrastructure in the United States. Amazon stated that its investment will increase the availability of curbside recycling for 3 million homes in communities across the country, making it easier for customers to recycle and further develop end markets for recycled commodities. The investment will divert 1 million tons of recyclable material from landfill into the recycling stream and eliminate the equivalent of 2 million metric tons of carbon dioxide by 2028—equivalent to shutting down a coal-fired power plant for six months, the company added. Closed Loop Fund invests in sustainable consumer goods, advanced recycling technologies and the development of the circular economy. Over the next 10 years, it aims to eliminate more than 16 million tons of greenhouse gas, divert more than 8 million cumulative tons of waste from landfills, improve recycling for more than 18 million households and save nearly \$60 million for American cities.

❖ Bultrite Holdings Acquires Lemco Hydraulics

October 23, 2018 – Bultrite Holdings, LLC acquired Lemco Hydraulics on October 12. Lemco, founded in 1967 by Dean Christensen, has served its long-term customer base for 51 years. Dean's son, Bruce Christensen, assumed ownership of the company in 1982 and will continue to serve as Lemco's president. Lemco, located in Hill City, Minnesota, designs and produces families of Truck Mount and Stationary Material Handlers, in addition to a full suite of Material Handling Attachments. Lemco products are known in a broad array of market niches the company serves, including forestry and logging, saw mills, municipalities, utilities, solid waste and material recycling and mining. Lemco will join with Bultrite Manufacturing, located in Two Harbors, Minnesota, to expand sales. Lemco Hydraulics becomes the third member of an alliance of companies being formed by Bultrite Holdings, LLC. The alliance, founded in April 2015, now includes three brands and long-standing companies: Bultrite Manufacturing, SAS Forks and Lemco Hydraulics.

❖ Summer Street Capital Invests in Waste, Recycling Platform

October 29, 2018 – Summer Street Capital Partners, a private equity fund based in Buffalo, New York, announced its investment in Southeast Florida waste and recycling platform Coastal Waste and Recycling, Inc. Summer Street partnered with industry veteran Brendon Pantano to execute an aggressive growth strategy and build a regional solid waste and recycling platform. Over the past 12 months, Coastal has completed four acquisitions across the Southeast Florida market, including Nu-Way Recycling in Martin County, Aquarius Recycling and Thoroughbred Waste in Palm Beach County and Mammoth Recycling in Broward County.

Select Industry News

❖ U.S. Plastics Recycling Rate Projected to Drop to 4.4% in 2018

October 5, 2018 – Plastic Pollution Coalition has published a new engineering estimate showing plummeting recycling rates for plastic in United States. Author Jan Dell, a chemical engineer, used U.S. Environmental Protection Agency (EPA) data and industry data to estimate the U.S. plastic recycling rate will sink from 9.1 percent in 2015 to 4.4 percent in 2018. Dell estimated the recycling rate could drop as low as 2.9 percent in 2019 if plastic waste import bans are adopted by more countries in Asia. The engineering estimate shows four factors contributing to the drop in recycling rates: plastic waste generation is increasing in the U.S.; exports counted as recycled have cratered due to China's ban; costs of recycling are increasing since many trucks are needed to collect the widely dispersed waste; plastic production expansion is keeping the prices of new plastics comparatively low; and these factors work against the key premise that waste plastic will someday have sufficient value to drive reclaiming it rather than disposing of it, according to the coalition. The United States ranks 20th on the list of countries contributing to plastic pollution in the ocean, with an estimated 88 to 242 million pounds per year of plastic marine debris. The annual International Coastal Cleanup confirmed the evidence of plastic pollution on U.S. coasts in 2017, when more than 3.7 million pounds of trash, the majority of it plastic, was collected by 209,643 people on a single day. The global movement Break Free From Plastic provides a Brand Audit Toolkit for people participating in cleanups to audit and identify the brands and corporations responsible for plastic pollution.

❖ Barry Caldwell Leaves Waste Management

October 18, 2018 – After 16 years at Waste Management, the company announced that Barry Caldwell, the senior vice president of corporate affairs and chief legal officer, has left. Caldwell joined Waste Management in 2002 as the company's senior vice president of public affairs and communications. In 2014, he was promoted to his most recent position. According to a PRWeek report, Caldwell's last day with Waste Management was August 11. The company is in search of filling a chief human resource officer position.

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❖ **Espinosa Joins AMP Robotics as Vice President of Operations**

October 23, 2018 – AMP Robotics Corp., a provider of artificial intelligence (AI) and robotics to the recycling and waste management industry, has hired Robb Espinosa as vice president of operations. In this role, he is responsible for overseeing and scaling AMP's operations, field engineering and technical support. Espinosa will report to CEO Matanya Horowitz. Espinosa brings more than 30 years of recycling and waste management industry experience to AMP. He has held leadership roles in a variety of industrial scale processing companies. Most recently, he was COO at Midwest Recycling Service and Sales, where he helped design, build, commission and optimize numerous materials recovery facilities (MRFs) nationwide. Previously, he was vice president of operations for Rational Energies, a plastics recycler that processes waste into fuel. Prior to that, he held leadership positions for Bulk Handling Systems (BHS), Greenstar North America and TRI-R Systems Corp.

❖ **Covanta Names New Vice President of Safety and Health**

October 24, 2018 – Covanta announced it has appointed Charles E. Clarke to the role of vice president of safety and health. He comes to Covanta from Air Liquide, based in Houston, where he was a corporate safety and industrial hygiene manager. At Covanta, Clarke is tasked with setting the direction and driving continuous improvement of the company's safety and health programs, identifying leading and lagging indicators for new and existing operations, construction and capital projects. He reports to Michael J. de Castro, Covanta's executive vice president of supply chain. Clarke brings with him more than 25 years of safety, health and environmental experience. In addition to Air Liquide, he has held various senior-level positions with Ascend Performance Materials, Rhone-Poulenc/Aventis and others, where he managed global teams.

❖ **Former Mayors Join Rubicon Boards**

October 24, 2018 – Rubicon Global announced former Indianapolis Mayor and smart city expert Stephen Goldsmith has joined Rubicon's Board of Directors and former Philadelphia Mayor and sustainability policy champion Michael Nutter has joined Rubicon's Advisory Board. Both roles are effective immediately. The former mayors will work with the Rubicon executive leadership team in key advisory roles, specifically around technology adoption and the growth of Rubicon's smart city offering. The RUBICONSmartCity platform provides comprehensive waste, recycling and community infrastructure data that enables cities to reduce operating expenses, divert waste from landfills, implement and improve recycling programs, track metrics and work toward long-term sustainability and quality of life goals.

❖ **West Lake Landfill Owners Sue Mallinckrodt**

October 25, 2018 – The owners of the West Lake Landfill in Bridgeton, Missouri, are suing Mallinckrodt LLC to help pay costs of the U.S. Environmental Protection Agency (EPA) cleanup. The EPA ordered a \$205 million cleanup to remove radioactive waste from the site. According to a St. Louis-Dispatch report, Mallinckrodt's predecessor, Mallinckrodt Chemical Works, processed uranium at its factory in St. Louis that was used in the U.S. government's Manhattan Project, a World War II-era program that produced the first nuclear weapons. In 1973, about 8,700 tons of leached barium sulfate from the weapons program was "mixed with approximately 38,000 tons of contaminated soil and used to cover trash being dumped" at the landfill, according to the EPA. The \$205 million cleanup calls for excavating about 70 percent of the landfill's Manhattan Project-era radioactivity and disposing of it out of state.

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Sources include Waste360, Waste Dive and various publicly available news publications. Additional information is available upon request.

