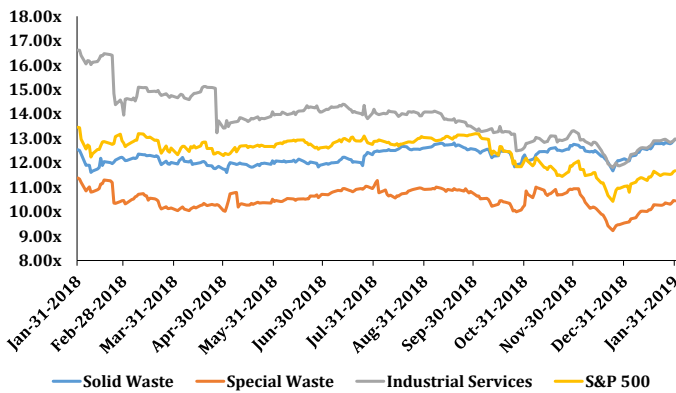


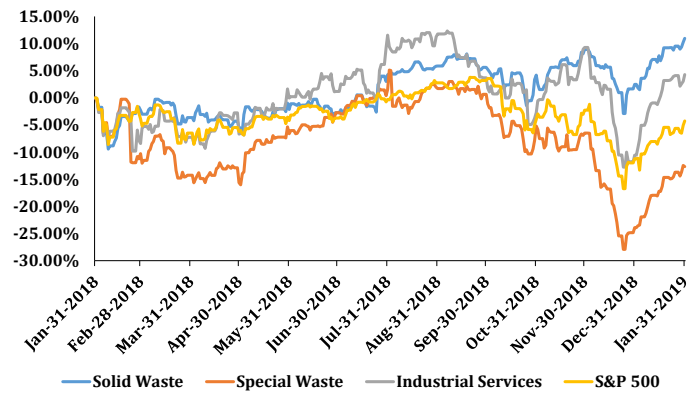
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Environmental Services LTM TEV/EBITDA



Environmental Services LTM Share Price (Shown as % change)



Indices Performance (% change)

	January 2019	LTM		January 2019	LTM
S&P 500	6.9%	(4.2%)	Solid Waste	8.3%	11.0%
Dow Jones	6.3%	(4.4%)	Special Waste	14.9%	(12.7%)
NASDAQ	8.3%	(1.8%)	Industrial Services	16.6%	4.3%

(Source: CapitalIQ)

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

Perma-Fix Environmental Services, Inc.	53.2%	None
Cypress Energy Partners, L.P.	40.2%	
Stericycle, Inc.	20.1%	
Clean Harbors, Inc.	20.0%	
Covanta Holding Corporation	20.0%	

Environmental Services Industry Contacts

Tom Denison
 (312) 283-0819
thomas.denison@thechicagocorp.com

Phil Clarke
 (312) 283-0803
philip.clarke@thechicagocorp.com



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Select Public Trading Statistics (as of 1/31/2019)

Solid Waste:

(\$ in millions, except per share data)

Company	Share Price 01/31/2019	% 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	\$95.67	99.5%	\$40,789	\$50,724	3.4x	12.4x	19.2x	18.1x	23.5x	23.6x	38.0%	18.3%	28.2%	2.4x
Republic Services, Inc.	BSG	\$76.71	97.7%	\$24,898	\$33,069	3.3x	11.9x	20.0x	18.2x	24.5x	24.4x	38.4%	16.7%	27.8%	3.0x
Waste Connections, Inc.	WCN	\$83.56	99.9%	\$21,988	\$25,506	5.3x	16.7x	29.6x	30.3x	33.8x	31.4x	41.7%	17.7%	31.5%	2.5x
Advanced Disposal Services, Inc.	ADSW	\$25.20	90.2%	\$2,234	\$4,108	2.7x	10.7x	43.9x	46.2x	49.1x	43.2x	35.0%	6.0%	24.7%	4.9x
Casella Waste Systems, Inc.	CWST	\$30.12	87.4%	\$1,401	\$1,914	3.0x	16.3x	38.1x	32.6x	52.6x	42.4x	31.6%	7.9%	18.5%	4.4x
Mean				\$18,262	\$23,064	3.5x	13.6x	30.2x	29.1x	36.7x	33.0x	36.9%	13.3%	26.1%	3.4x
Median				\$21,988	\$25,506	3.3x	12.4x	29.6x	30.3x	33.8x	31.4x	38.0%	16.7%	27.8%	3.0x
High				\$40,789	\$50,724	5.3x	16.7x	43.9x	46.2x	52.6x	43.2x	41.7%	18.3%	31.5%	4.9x
Low				\$1,401	\$1,914	2.7x	10.7x	19.2x	18.1x	23.5x	23.6x	31.6%	6.0%	18.5%	2.4x

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 01/31/2019	% 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		
Storcycle, Inc.	SRCL	\$44.08	57.4%	\$3,593	\$6,791	1.9x	11.1x	19.7x	25.6x	14.3x	13.8x	39.6%	9.8%	17.3%	4.6x
Darling Ingredients Inc.	DAR	\$21.27	95.0%	\$3,502	\$5,161	1.5x	9.2x	21.4x	21.2x	62.6x	22.7x	21.8%	3.4%	12.5%	3.7x
Clean Harbors, Inc.	CLH	\$59.21	81.7%	\$3,316	\$4,687	1.5x	10.0x	26.8x	25.1x	NM	NM	29.9%	5.5%	14.7%	2.9x
US Ecology, Inc.	ECOL	\$63.67	82.5%	\$1,403	\$1,654	3.1x	13.4x	20.0x	21.0x	30.5x	26.2x	31.7%	15.3%	22.7%	2.0x
Sharps Compliance Corp.	SMDI	\$4.00	77.7%	\$65	\$60	1.4x	NM	NM	NM	NM	NM	29.9%	0.4%	4.2%	(2.7x)
Perma-Fix Environmental Services, Inc.	PEFI	\$3.60	69.9%	\$43	\$45	0.9x	23.7x	129.5x	22.7x	NM	NM	24.1%	0.7%	3.8%	1.9x
Mean				\$2,084	\$3,066	1.7x	13.5x	43.5x	23.1x	35.8x	20.9x	29.5%	5.8%	12.5%	2.1x
Median				\$2,359	\$3,170	1.5x	11.1x	21.4x	22.7x	30.5x	22.7x	29.9%	4.5%	13.6%	2.5x
High				\$3,993	\$6,791	3.1x	23.7x	129.5x	25.6x	62.6x	26.2x	39.6%	15.3%	22.7%	4.6x
Low				\$43	\$45	0.9x	9.2x	19.7x	21.0x	14.3x	13.8x	21.8%	0.4%	3.8%	(2.7x)

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 01/31/2019	% 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	\$16.10	89.2%	\$2,109	\$4,552	2.4x	13.2x	37.3x	7.8x	NM	NM	30.5%	6.0%	17.7%	7.4x
Heritage-Crystal Clean, Inc.	HCCL	\$25.60	89.2%	\$590	\$573	1.4x	13.3x	21.5x	25.0x	38.9x	22.3x	22.6%	6.7%	10.8%	(0.4x)
CECO Environmental Corp.	CECE	\$6.88	74.9%	\$240	\$293	0.9x	12.3x	30.3x	NM	31.9x	20.9x	34.1%	3.0%	7.5%	2.2x
Cypress Energy Partners, L.P.	CELP	\$7.88	92.7%	\$94	\$181	0.6x	9.0x	12.2x	9.4x	NM	NM	14.0%	4.9%	6.8%	3.2x
Ecology & Environment, Inc.	EEI	\$11.53	79.8%	\$50	\$35	0.3x	6.5x	8.1x	23.4x	NM	NM	44.7%	4.1%	5.1%	(3.0x)
Fuel Tech, Inc.	FTEK	\$1.24	68.0%	\$30	\$26	0.5x	27.0x	NM	NM	NM	NM	36.6%	0.0%	1.8%	(4.4x)
Quest Resource Holding Corporation	QRHC	\$1.53	49.3%	\$23	\$27	0.3x	NM	NM	NM	NM	NM	15.3%	(3.9%)	(0.4%)	(8.9x)
Industrial Services of America, Inc.	ISAA	\$1.27	46.9%	\$10	\$18	0.3x	6.8x	30.1x	NM	NM	NM	6.6%	1.0%	4.4%	3.0x
Mean				\$393	\$713	0.8x	12.6x	23.3x	16.4x	35.4x	21.6x	25.6%	2.7%	6.7%	-0.1x
Median				\$72	\$108	0.5x	12.3x	25.8x	16.4x	35.4x	21.6x	26.6%	3.6%	5.9%	0.9x
High				\$2,109	\$4,552	2.4x	27.0x	37.3x	25.0x	38.9x	22.3x	44.7%	6.7%	17.7%	7.4x
Low				\$10	\$18	0.3x	6.5x	8.1x	7.8x	31.9x	20.9x	6.6%	-3.9%	-0.4%	(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

❖ Resolute Completes Sale of South Carolina Paper, Pulp Mill

January 3, 2019 – Canadian firm Resolute Forest Products Inc. has completed the sale of its kraft pulp and paper mill in Catawba, South Carolina, to Ontario, California-based New-Indy Containerboard LLC. The company initially announced terms of the asset purchase agreement on October 2, 2018, according to a Recycling Today report. According to Resolute Forest Products, the total purchase price of about \$300 million consists of \$260 million in cash, before customary closing adjustments and the assumption of approximately \$40 million of balance sheet liabilities, largely net pension benefit obligations. Resolute maintained it has agreed to use the majority of the proceeds from the asset sale to repurchase \$225 million of its 5.875 percent Senior Notes due in 2023.

❖ LRS Acquires Commercial Waste, Recycling Routes from Molenhouse

January 9, 2019 – Lakeshore Recycling Systems (LRS), an independent recycling and waste diversion services provider in the Midwest, announced the acquisition of commercial waste and recycling routes from Molenhouse Enterprises, Inc., a long-standing suburban Chicago waste hauler. Financial terms were not disclosed. Effective immediately, Molenhouse will continue operations as Molenhouse Enterprises, Inc., delivering roll-off dumpster and demolition services; while commercial waste and recycling routes in DuPage and Kane counties will be serviced by LRS, including the city of Wheaton, village of Glen Ellyn and the city of Naperville. Molenhouse is a family-owned and operated waste, recycling and building demolition hauler serving Chicagoland since 1979. Commercial services will be delivered and billed through LRS, and invoices for Molenhouse commercial customers will now be billed under Lakeshore Recycling Systems. The LRS-Molenhouse partnership adds 10 commercial routes and strengthens LRS' residential waste and recycling presence in Wheaton, Lisle, Geneva, Elburn, St. Charles and the West Chicago, according to the company.

❖ TemperPack Raises \$22.5M for Expansion, Packaging Solutions

January 15, 2019 – TemperPack, a provider of sustainable thermal packaging solutions, has raised \$22.5 million in Series B financing led by Revolution Growth, with other new investors Harbert Growth Partners, Arborview Capital and Tao Capital Partners and with existing investor SJF Ventures also participating in the round. With the new financing, Todd Klein, partner at Revolution Growth, and Brian Carney, general partner at Harbert Growth Partners, will join the board. TemperPack engineers, manufactures and distributes sustainable packaging products that replace single-use plastics, such as Styrofoam, with proprietary bio-based materials. Founded in 2015 by James McGoff, Brian Powers and Charles Vincent, TemperPack has grown rapidly in pursuit of its mission to reduce the amount of unsustainable packaging driven by the rise of e-commerce food and life science cold chain logistics. In addition to being harmful to the environment, packaging waste represents one-third of all municipal trash and costs local governments billions of dollars to dispose of each year. TemperPack designs and tests products in its proving ground laboratory to meet client specifications in fields ranging from fresh food delivery to the shipment of biologic drugs. TemperPack's patent-pending ClimaCell technology is a sustainable alternative to plastic foams such as Styrofoam, according to the company. ClimaCell is How2Recycle certified and curbside recyclable. Today, TemperPack operates two factories in Virginia and Nevada and is rapidly expanding its reach in the food and life science cold chain logistics markets, all with the goal of reducing the amount of packaging that ends up in landfills. It estimates that it has avoided 15 million pounds of carbon emissions and diverted 10 million pounds of plastic foam from landfills. Manufacturing ClimaCell is estimated to reduce carbon emissions by 97 percent compared to manufacturing comparable plastic foam, according to the company.

❖ AMCS Acquires Recy Systems

January 22, 2019 – AMCS, one of the world's leading suppliers of integrated software and vehicle technology for the waste and recycling sector, has announced the acquisition of Germany-based recycling and waste management software specialist Recy Systems. Recy has offices in Germany, U.S., U.K. and Slovakia, and its customers include some of the world's largest and most complex recycling companies. Overall, the acquisition will add another 600 customers from across Europe, North America, Asia and Africa, growing AMCS' total customer base to more than 2,400 worldwide. In addition to growing AMCS' market share in the high-growth German market, the acquisition will support its continued development of a best-in-class global solution for the metal recycling industry. It will also contribute to the development of the company's platform used by the wider waste, recycling and resource management sector to maximize efficiency and increase profitability. AMCS' existing solution portfolio will be further strengthened by Recy's world-class suite of software, including its state-of-the-art functionality for managing complex stock inventory and valuation requirements. Recy's sector-specific model ensures that its products are designed exclusively for the waste, recycling and material trading industry, covering steel scrap, non-ferrous metals, paper, wood, glass, plastic, textiles and electronics. The acquisition will also deliver significant synergy with the Brady Recycling Solutions business, purchased by AMCS a year ago. In addition to adding more than 100 customers in North America, Europe and Australasia, the Brady acquisition also extended AMCS' portfolio of solutions designed specifically for commercial scrap metal recycling operations.

❖ St. Louis Composting to Acquire South Kansas City Compost Facility

January 28, 2019 – St. Louis Composting, Inc. has acquired Lawn-Corps, a family-owned and operated green waste company in South Kansas City, Missouri. The acquisition will leverage the equipment that St. Louis Composting already has and increase the volumes of finished mulches and composting. St. Louis Composting acquired Lawn-Corps through its operating company Organic Resource Management. The company is not new to the region, as it operates a location in Lee Summit, Missouri, noted St. Louis Composting. Originally a \$25 million company, St. Louis Composting said it will grow by \$1.5 million with the

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acquisition. Lawn-Corps is a 37-acre yard waste processing facility in Belton, Missouri, that collects and processes yard waste into high-grade products such as compost and organically dyed mulches. Since 1992, Lawn-Corps has been providing Kansas City homeowners with yard waste collection. The facility is state permitted and in compliance with the Missouri Department of Natural Resources. Serving approximately 3,500 households in the Kansas City region, Lawn-Corps will continue to operate under its name and its staff of eight employees will stay onboard.

Select Industry News

❖ County Waste Slammed for Not Notifying Customers of Rate Hike

January 4, 2019 – Since Virginia-based County Waste increased its waste and recycling services rates without properly informing its customers, the company has received complaints and 400 service cancellations. According to ABC 13, County Waste initially didn't inform customers of the rate hike because the move would "inundate the company's call center." It wasn't until January invoices went out in December that most customers found out their rates were increasing.

❖ Gopher Resource Appoints New Leaders

January 7, 2019 – Gopher Resource, a national environmental solutions provider based in Eagan, Minnesota, has announced the recent appointment of Brian Leen to president and CEO. Joining Leen on the executive leadership team is Eric Robinson in the newly created position of senior vice president and chief operating officer. Most recently, Leen held the same position with ADA Carbon Solutions, based in Colorado. He replaces Jeffrey Jacobsen, who retired from Gopher in October and remains on the company's board. Robinson also joins Gopher Resource from ADA Carbon Solutions. Jacobsen explained that in addition to Leen's and Robinson's combined 55 years of experience in the specialty chemicals and materials industries, both men have extensive knowledge of Gopher Resource. They are on the company's board and were involved in the early 2018 acquisition of Gopher Resource by Energy Capital Partners, which also owned ADA Carbon Solutions. In his new role, Robinson will focus on continual process improvement, quality control and advancing overall safety and environmental standards.

❖ Covanta Begins Construction of Total Ash Processing System

January 8, 2019 – Covanta Holding Corporation has commenced construction of its first Total Ash Processing System (TAPS), with operational start-up expected in the second half of 2019. Located in Fairless Hills, Pennsylvania, adjacent to Covanta's existing metals processing facility, the first TAPS plant is designed to process more than 400,000 tons of ash from multiple Covanta energy-from-waste (EfW) facilities, recovering previously untapped value from these waste streams. TAPS is a technology that separates the combined ash from EfW facilities into its component parts. This enables increased recovery of small metal fractions and the recovery of aggregate for reuse as construction material, reducing the volume of ash requiring landfill disposal by as much as 65 percent, according to Covanta.

❖ Global Recruiters Helps with Placement of Meridian Waste CFO

January 16, 2019 – Global Recruiters (GRN) of McKinney, Texas, announced the placement of Chief Financial Officer Greg Hamilton at Meridian Waste, headquartered in Greensboro, Georgia. Hamilton is an industry veteran with more than 24 years of experience. Most recently, he served as CFO at Curtis Bay Medical Waste Services, a regulated medical waste (RMW) disposal company serving a growing number of leading hospitals and healthcare providers across the East Coast. Prior to joining Curtis Bay, Hamilton served as the CFO and corporate secretary at Santek Waste Services, a solid waste company serving 10 states. There, he was instrumental in more than doubling the size of the company over a span of five years, closing multiple negotiations and financing more than \$200 million of business for the company. Global Recruiters of McKinney is a worldwide executive search firm specializing in the waste and environmental services industry. Hamilton's placement was handled by Tyler Frisbie, president of GRN McKinney.

❖ Malaysia to Shutter 100 Illegal Plastic Waste Factories

January 18, 2019 – One hundred illegal plastic waste factories in Malaysia are set to be shut down in the first quarter of 2019, the country's environment minister announced. According to a Malay Mail report, since the freeze on importing plastic waste into Malaysia took effect last summer, 61 operations were conducted in illegal factories. Licensed factories will be scrutinized to determine if their operations adhere to the law, according to the report. Currently, some 97 illegal factories have been detected nationwide. Most are concentrated in Selangor, but others include six in Johor, 10 in Kedah and 10 in Negri Sembilan, according to the report. Additionally, the ministry has opened 36 investigation papers into the operators of the illegal factories.

❖ NWRA Promotes Four Staff Members

January 28, 2019 – National Waste & Recycling Association (NWRA) President Darrell Smith announced the promotion of four staff members: Steve Changaris, LaWanda Jones, Peggy Macenas and Brandon Wright. Changaris was promoted to vice president, Northeast Region; Jones was promoted to director, internal operations; Macenas was promoted to vice president, Midwest Region; and Wright was promoted to vice president, communications and media relations.



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Changaris has worked for more than 25 years at NWRA. He covers the northeastern states of New York, New Jersey, Delaware, Maryland, Massachusetts, Rhode Island, Connecticut, New Hampshire, Vermont and Maine. He works with the region's NWRA recycling, organics and waste companies and interacts on their behalf at the state, local, regional, special authority and county levels. He works with elected and legislative officials as well as administrative and regulatory officials in all solid waste and recycling areas. Since 1998, Jones has worked for NWRA. In her role as director, internal operations, she is in charge of all information technology and database-related issues/inquiries. Prior to her employment with NWRA, Jones was enlisted in United States Army Reserves. She attended Strayer University and has received multiple certifications from COMPTIA. Since 1993, Macenas has served the member companies for NWRA, initially as national membership director providing education programs and membership development. In 1998, she was named the manager, Midwest Region with the responsibility of managing the legislative and regulatory affairs on behalf of the NWRA State Chapters in the Midwest. Macenas also serves as director of the NWRA Women's Council. Prior to joining the association, she worked on the production side and in the regulatory arena of the cable television industry and has served as the executive director for several nonprofit associations before joining NWRA. Wright, who serves as NWRA's vice president, communications and media relations, joined NWRA in October 2017. Before joining NWRA, he was chief of staff at the Maryland Department of Planning and served in a senior leadership role at the Maryland Department of Health. He also served as communications director at the Petroleum Marketers Association of America and led communications efforts on several advocacy initiatives in Annapolis, Md.

❖ Covanta Expands Partnership with Wreaths Across America

January 31, 2019 – Covanta has expanded its partnership with Wreaths Across America to sustainably recycle and dispose of wreaths that are laid on gravestones of military veterans at cemeteries across the United States. Wreaths Across America is a national nonprofit organization founded in 2007 with a mission to remember the fallen, honor those that serve and their families and teach the next generation about the value of freedom. In the weeks following the end of the holiday season, Wreaths Across America volunteers collect hundreds of thousands of evergreen wreaths placed at more than 1,640 participating locations. To help ease the burden of disposal, the wreaths are delivered and processed at nearby Covanta energy-from-waste facilities free of charge. As an added benefit, Covanta's facilities recover energy from the organic portion of the wreaths and the metal frame is collected for recycling. Covanta has participated in the program since 2017 and is now accepting wreaths at six locations in Virginia—Covanta Fairfax and Covanta Alexandria/Arlington—and at all of Covanta's facilities on Long Island, New York—Covanta Hempstead, Covanta Huntington, Covanta Babylon and Covanta MacArthur. Wreaths from Arlington National Cemetery in Virginia are processed at Covanta Fairfax and Covanta Alexandria/Arlington. Wreaths collected from Long Island National Cemetery in Farmingdale, New York, are sent to Covanta's Long Island facilities. Covanta's Long Island facilities alone will collect approximately 40,000 wreaths, generating enough energy to supply electricity to eight homes for one month. In addition, the metal recovered from the Long Island facilities amounts to more than 1,000 pounds, enough to manufacture more than 8,000 soup cans.

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

