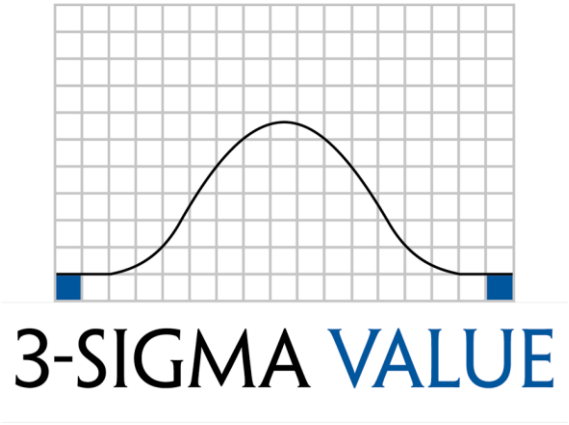

Energy Investing After the Price of Oil Drops – The Year is 2015

Part II: The Sand Bubble

The Sand Bubble

Demand for sand – high quality Northern White sand and lower quality Brown sand – has skyrocketed over the past ten years[1] in connection with the adoption of hydraulic fracturing (a.k.a. fracking). Fracking is the process of pumping fluids down a well at high pressure to fracture a rock formation. Once the formation is fractured, a granular material called a proppant remains behind to keep (prop) open the fissures, allowing hydrocarbons to flow.

There are three kinds of proppants commonly used in fracking:

1. Raw sand ~80% of the market;
2. Resin coated sand (RCS) is higher cost than raw sand but provides higher performance. Typically, deeper wells with higher temperature/pressure are more likely to use RCS;
3. Ceramic proppants are the highest-performance, highest-priced proppant solution. The global ceramic market is highly fragmented, led by CARBO Ceramics (CRR – 11% of 2014 industry capacity), Fores (7%), St. Gobain (5%), Imerys (5%), Mineracao Curimbaba (4%), JSC Borovichi (3%), Others (65%).

When considering the use of proppants, the trade-off is cost versus crush strength (the ability of the proppant to withstand high pressures). Resin coated sand (RCS) and ceramic proppants have higher crush strength than raw sand but are far more expensive.

Oil and gas exploration and production companies (E&Ps) report that using more sand stimulates the well and produces more oil and gas. Some E&Ps are buying their own sand mines and cutting out the middleman. Moreover, there is a secular shift from ceramics to sand as some of the key shale basins are ductile in nature, where high clay content causes proppant embedment from formation buckling. Embedment or formation caving can be reduced by using higher concentrations of proppants, which is typically sand given its cost advantage.

Until recently, the only publicly-traded pure-play proppant company is the market leader in ceramics – **CARBO Ceramics (CRR)**, a former market favorite that has crashed from $156 per share in June 2014 to a recent $45 (low of $28). In its place, four pure-play sand companies

[1] From ~6 million tons in 2006 to ~50 million in 2015.

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have risen like tulip vendors in 17th century Amsterdam. Two are C-Corps and two are MLPs: **US Silica Holdings, Inc. (SLCA), FMSA Holdings f.k.a. Fairmount Santrol (FMSA), Emerge Energy Services LP (EMES), and Hi-Crush Partners LP (HCLP).**

Since late last year, in connection with the approx. 50% decline in horizontal rig counts, demand for frac sand is down 30-40%. At the same time, new sand supply is coming online, flooding the market. Part of the new supply is greenfield – facilities that were planned and approved when the price of sand was elevated – and part is due to de-bottlenecking transportation, a situation that was restricting supply and artificially driving up prices.

Supply versus Demand

Supply (in millions of tons) increased from 42 in 2012 to 57 and 68 in 2013 and 2014 respectively. Supply is expected to increase to around 76 million tons in 2015 and 85 million in 2016. After recent consolidation, the top 10 sand suppliers account for 76% of sand capacity:

	Supplier	Raw Sand	RCS	Ceramics	Raw Sand Capacity	Market Share
1	FMSA Holdings f.k.a. Fairmount Santrol (FMSA)	x	x		13.4	18%
2	Uninim Corporation (private)	x	x		12.0	16%
3	US Silica Holdings, Inc. (SLCA)	x	x		10.9	14%
4	EOG Resources (EOG)	x			7.0	9%
5	Emerge Energy Services LP (EMES)	x			6.9	9%
6	Hi-Crush Partners LP (HCLP)	x			4.2	6%
7	Pioneer Natural Resources / Carmeuse (PXD)	x			1.2	2%
8	Badger Mining + Atlas Resin Properties (private)	x	x		1.2	2%
9	Preferred Sands LLC (private)	x	x		1.3	2%
10	CARBO Ceramics (CRR)		x	x	0.0	0%
	Others*				17.9	24%
	Total				76.0	100%

* Includes Premier Silica LLC, Pattison Sand Co., Ogelbay-Norton Company, Momentive Performance Materials Inc., Southern Precision Sands, Saint-Gobain Proppants, Grupo Curimbaba.

According to the February 2015 "Proppant IQ" proppant market analysis report published by PacWest Consulting Partners, LLC ("PacWest"), 2015 frac sand demand is forecasted to be approximately 42.9 million tons, a 14% decrease compared to 49.8 million tons in 2014. Further, the report forecasts a 6% decrease in the compound annual growth rate for North American frac sand between 2014 and 2016.

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	2014	2016
Frac Sand Supply	76.0	85.0
% Growth		11.8%
Frac Sand Demand	49.8	43.8
% Growth		-12.0%
Over (Under)-Supply	26.2	41.2
% Utilization	65.5%	51.5%

The sand market will be approximately 51.5% over-supplied in 2016 causing sand prices to continue plummeting to their marginal cost of production ~ $20 per ton. On its Q1 2015 earnings conference call, FMSA Holdings / Fairmount Santrol (FMSA) announced the closing of "high cost" raw sand facilities in 1Q15, which it defines as cost of production greater than $20 per ton.

At $20 per ton, the C-Corps (FMSA and SLCA) are bankrupt, and the MLPs (EMES and HCLP) will slash their dividends to zero.

	Price as of	Shares	Market			Enterprise	EBITDA			EPS / Distributable Cash Flow per Unit		
Proppant Suppliers	6/12/2015	Out	Cap	Debt	Cash	Value	2014	2015	2016	2014	2015	2016
FMSA Holdings Inc. f.k.a. Fairmount Santrol (FMSA)	$8.73	161,340	1,408,498	**1,250,821**	118,372	2,543,560	373,270	166,170	95,135	1.03	0.18	-0.11
10/14 IPO; C-Corp							6.8x	15.3x	26.7x	8.5x	48.5x	-81.9x
US Silica Holdings, Inc. (SLCA)	$31.39	53,390	1,675,912	494,194	327,808	1,902,230	221,186	84,969	45,621	2.24	0.12	-0.43
2/12 IPO; C-Corp							8.6x	22.4x	41.7x	14.0x	272.8x	-72.2x
CARBO Ceramics (CRR)	$45.52	23,270	1,059,250	87,547	96,143	1,050,654	165,200	-8,500	6,000	2.41	-2.06	-0.60
5/96 IPO; C-Corp							6.4x	-123.6x	175.1x	18.9x	-22.1x	-75.9x
Emerge Energy Services LP (EMES)	$40.08	23,720	950,698	232,086	6,484	1,176,300	121,733	81,400	NA	3.70	1.42	NA
5/13 IPO; Variable distribution MLP							9.7x	14.5x	NA	10.8x	28.2x	NA
Hi-Crush Partners LP (HCLP) - variable distribution MLP	$30.88	23,320	720,122	212,435	4,913	927,644	143,200	108,400	NA	3.17	2.39	NA
8/12 IPO; Variable distribution MLP							6.5x	8.6x	NA	9.7x	12.9x	NA

Of the five publicly-traded proppant suppliers, FMSA Holdings (FMSA) raises the reddest flags:

1. Highest balance sheet leverage with $1.3 billion of debt.
2. Product leverage to RCS, the proppant losing the most share to raw sand.
3. Most recent IPO (October 2014) – LIFO rule applies to analyzing IPOs – the last in is usually the first out.
4. FMSA is the only one that doesn't pay a dividend.

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On October 3, 2014, FMSA went public at $16 per share. The share price broke $10 a week and a half later on October 15, 2014, and reached a low of $4.91 on January 30, 2015. FMSA reports two segments: (1) Oil & Gas - 7.2 million tons sold in 2014 (76%) representing 91% of revenue via 42 proppant distribution terminals and a fleet of 9,300 rail cars; and (2) Industrial & Recreational - 2.4 million tons sold in 2014 (24%); end markets include foundry, glass, building products, sports and recreation, specialty.

The key differentiator according to FMSA is its market-leading production and sale of resin-coated sand (RCS), which is higher cost and higher margin (for now). With prices plummetting, however, and frackers shifting to lower-priced raw sand and away from higher priced RCS and ceramics, this advantage (in a bull market) is morphing into a fatal disadvantage.

FMSA Holdings / Fairmount Santrol (FMSA) - Base Case: Scenario 1					
	2013	2014	2015	2016	2017
Capacity		13,400,000	13,400,000	13,400,000	13,400,000
% Change			0%	0%	0%
Volumes (in tons):					
Raw Sand	4,088,136	5,713,374	5,987,414	6,000,000	6,000,000
% Change - sequential		39.8%	4.8%	0.2%	0.0%
Coated Proppant	1,028,567	1,475,095	999,263	899,337	809,403
% Change - sequential		43.4%	-32.3%	-10.0%	-10.0%
Total Proppant Solutions	5,116,703	7,188,469	6,986,677	6,899,337	6,809,403
% Change - sequential		40.5%	-2.8%	-1.3%	-1.3%
Industrial & Recreational Products	2,461,750	2,425,756	1,969,083	1,772,175	1,594,957
% Change - sequential		-1.5%	-18.8%	-10.0%	-10.0%
Total Volumes	7,578,453	9,614,225	8,955,760	8,671,512	8,404,360
Utilization		72%	67%	65%	63%
Average Selling Price (ASP)					
Proppant Solutions	$167.34	$171.42	$132.17	$118.95	$107.06
% Change - sequential		2.4%	-22.9%	-10.0%	-10.0%
Industrial & Recreational Products	$53.69	$51.21	$46.67	$42.01	$37.81
% Change - sequential		-4.6%	-8.9%	-10.0%	-10.0%
Revenue:					
Proppant Solutions	856,212	1,232,232	923,421	820,690	728,993
Industrial & Recreational Products	132,174	124,226	91,904	74,442	60,298
Total Revenue	988,386	1,356,458	1,015,325	895,132	789,291
% Change - YoY		37.2%	-25.1%	-11.8%	-11.8%

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The key operating assumptions (factors) in the derivation of FMSA's revenue are (1) volumes and (2) average selling price (ASP). In Base Case: Scenario 1, we assume raw sand volumes are flattish ~1.5 million tons per quarter (6 million per year) – an optimistic assumption considering ProppantIQ's negative projections into 2016. On pricing, ASPs were down 10.5% in 1Q 2015, a rate of decline that is likely to accelerate in 2Q 2015.

Estimating the impact of a change in revenue on gross margin requires discriminating between fixed and variable costs. Furthermore, we exclude DD&A and stock-based compensation in order to isolate the cash cost of production.

FMSA Holdings / Fairmount Santrol (FMSA) - Base Case: Scenario 1					
	2013	2014	2015	2016	2017
Cost of Sand Sold (COGS) - fixed	301,675	403,823	413,712	414,033	414,033
Cost of Sand Sold (COGS) - variable: 33% of 2014 revenue attributed to logistics	326,167	447,631	335,057	295,393	260,466
Total COGS (ex. DD&A and stock comp)	627,842	851,454	748,769	709,427	674,499
Gross Profit	360,544	505,004	266,556	185,705	114,792
Gross Profit per Ton ($/ton)	47.57	52.53	29.76	21.42	13.66
% Margin	36.5%	37.2%	26.3%	20.7%	14.5%
Operating Expenses					
DD&A	37,771	59,379	66,658	72,108	77,558
% of Revenue	3.8%	4.4%	6.6%	8.1%	9.8%
SG&A	81,858	114,227	85,561	75,433	66,514
% of Revenue	8.3%	8.4%	8.4%	8.4%	8.4%
Stock Comp	10,133	16,571	15,138	15,138	15,138
Other	2,826	3,163	-313	0	0
Operating Income (EBIT)	227,956	311,664	99,511	23,026	-44,418
% Margin					
Interest Expense	61,926	60,842	62,389	62,775	62,775
Other	16,154	2,786	324	0	0
Pre-tax Income	149,876	248,036	36,798	-39,749	-107,193
Taxes	45,219	77,413	9,207	-11,925	-32,158
% Rate	30.2%	31.2%	25.0%	30.0%	30.0%
Net Income	104,657	170,623	27,591	-27,824	-75,035
Net Income Attributable to Min Int	696	173	121	0	0
Net Income to FMSA	103,961	170,450	27,470	-27,824	-75,035
FD Shares Out	164,638	166,277	166,339	166,339	166,339
EPS	0.63	1.03	0.17	-0.17	-0.45
EBITDA	265,727	371,043	166,170	95,135	33,140
+ Stock Comp	10,133	16,571	15,138	15,138	15,138
+/ Change in A/R	-22,097	-66,406	28,650		
+/ Change in Invy	158	-13,264	14,624		
+/ Prepaid Expenses	-11,698	-23,454	3,567		
+/ Change in A/P	46,542	-1,456	-17,255		
+/ Change in Accrued Expenses	-12,616	17,488	-4,363		
- Cash Interest Expense	-61,926	-60,842	-62,389	-62,775	-62,775
- Cash Taxes	-45,219	-77,413	-9,207	11,925	32,158
- Capex (Maintenance Capex = 25-30 per annum)	-111,514	-143,491	-102,500	-109,000	-109,000
= Cash Available for Distribution (or to pay down debt)	57,490	18,776	32,434	-49,578	-91,339
Cumulative Cash Generation/Burn (2015-2017)					-108,484

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The largest use of cash is capital expenditures. 2015 guidance is $90 million to $115 million (midpoint = $102.5 million); meanwhile, $163 million of railcar purchases are due within 3 years. Using management's guidance for maintenance capex ($25 million to $30 million) and no incremental capex beyond what is already contracted, we estimate $218 million of total capital expenditures in 2016/2017 ($109 million per year).

Making matters more complicated is the existence of $1.3 billion of debt on FMSA's balance sheet offset by only $118 million of cash (as of 3/31/15).

FMSA Holdings / Fairmount Santrol (FMSA) - Base Case: Scenario 1							
Debt	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017	Int Rate	Int Exp
Revolver - $75M capacity	42.8	1.0				3.8%	0.0
Term Loan B-1 due 3/15/17	322.7	319.9				3.8%	12.2
Term Loan B-2 due 9/5/19	878.6	910.9				4.5%	49.8
Other, incl. Capital Leases	18.1	20.8				3.8%	0.8
Total Debt	1,262.2	1,252.6	1,252.6	1,252.6	1,252.6		62.8
Cash	17.8	76.8	108.2	54.3	-44.7		
Net Debt	1,244.4	1,175.8	1,144.4	1,198.3	1,297.3		
Test - Debt / LTM EBITDA	4.75x	4.75x	4.75x	4.75x	4.75x		
Actual - Debt / LTM EBITDA	4.31x	3.15x	7.54x	13.17x	37.80x		
Implied LTM EBITDA	288.7	373.3	166.2	95.1	33.1		

Only in an Upside Case operating scenario, in which volumes resume growing toward full capacity utilization and ASP declines moderate does FMSA avoid tripping its debt covenant. In this case, we apply a discounted cash flow (DCF) analysis, sanity checked with P/E to arrive at a $6.76 target price.

Upside - Average of DCF and P/E	$6.76	20%	$1.35
Base - distressed sale at 1x 2017 sales	$0.00	60%	$0.00
Downside = bankrupt	$0.00	20%	$0.00
Probability-weighted Target Price			$1.35

Akin to FMSA Holdings, US Silica Holdings, Inc. (SLCA) went public in February 2012 and has since rapidly expanded its sand capacity to 10.9 million tons. Unlike FMSA, SLCA has a relatively solid balance sheet with $494 million of debt offset by $328 million of cash. Nevertheless, when the price of sand approaches its marginal cost of production ~$20 per ton, profits will evaporate, asset values will shrink, and the stock price will cleave.

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US Silica Holdings, Inc. (SLCA) - Base Case: Scenario 1					
	2013	2014	2015	2016	2017
Capacity		10,900,000	10,900,000	10,900,000	10,900,000
% Change			0%	0%	0%
Volumes (in tons):					
Oil & Gas Proppants	4,078	6,736	6,188	6,343	6,501
% Change - sequential		65.2%	-8.1%	2.5%	2.5%
Industrial & Specialty Products	4,084	4,192	3,932	4,030	4,131
% Change - sequential		2.6%	-6.2%	2.5%	2.5%
Total Volumes	8,162	10,928	10,120	10,373	10,632
% Change - sequential		33.9%	-7.4%	2.5%	2.5%
Utilization		100%	93%	95%	98%
Average Selling Price (ASP):					
Oil & Gas Proppants	$85.20	$98.39	$76.14	$64.72	$55.01
% Change - sequential		15.5%	-22.6%	-15.0%	-15.0%
Industrial & Specialty Products	$48.62	$51.04	$52.09	$49.48	$47.01
% Change - sequential		5.0%	2.0%	-5.0%	-5.0%
Combined	$66.89	$80.23	$66.79	$58.80	$51.90
% Change - sequential					
Revenue:					
Oil & Gas Proppants	347,439	662,770	471,154	410,493	357,642
Industrial & Specialty Products	198,546	213,971	204,804	199,428	194,193
Total Revenue	545,985	876,741	675,958	609,920	551,835
% Change - YoY		60.6%	-22.9%	-9.8%	-9.5%

As revenue shrinks, so do margins. EPS turns negative in the second half of 2015 under Base Case operating assumptions. Only in an Upside Case, in which volumes resume growth toward full capacity utilization and ASP declines moderate will SLCA be able to continue paying its $0.50 dividend.

The major difference between SLCA and FMSA is the balance sheet. FMSA will be the first frac sand company to file Chapter 11. During that time, SLCA will announce the cutting of its dividend to zero. The stock will react but it won't go straight to zero. Based on a discounted cash flow (DCF) analysis, sanity checked with P/E, SLCA is worth no more than $9.32 per share.

Upside - Average of DCF and P/E	$9.32	20%	$1.86
Base - distressed sale at 1x 2017 sales	$6.04	60%	$3.63
Downside = bankrupt	$0.00	20%	$0.00
Probability-weighted Target Price			$5.49

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Finally, regarding the MLPs – Emerge Energy Services LP (EMES) and Hi-Crush Partners LP (HCLP) – because they pay substantial dividends, the total return on shorting them is less than the total return on shorting the C-Corps, with the gap widening over time. Moreover, their balance sheets are clean. Ergo, profiting off the recognition of The Sand Bubble is optimized by concentrating on the C-Corps, not the MLPs.

Final Thoughts on Asset Valuations

Sand capacity expansion (replacement cost) is cheap and easy – Emerge (EMES) says it can increase capacity by 1 million tons per annum simply by debottlenecking a pair of facilities for just $1.5 million of incremental capital spend and within 3 months. Also, EMES is working on a new 2.5 million tons per annum capacity plant with only a $35 million investment. More generally, EMES says the all-in cost of building a new 2.5 million tons per annum plant is approx. $65 million. At only $26 capex per ton of annual capacity, the supply response to any unexpected increase in demand will be fast, limiting upside pricing risk.

In sum, there is no underlying asset valuation support. Without cash flows or valuable assets, the business model for independent frac sand production is fatally flawed and the current margin structure unsustainable.

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