2015
PROPPANT MARKET REPORT

CONFIDENTIAL

2015 Report Summary

PropTester® Inc.

KELRIK

Table of Contents

2015 Report Summary

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Forward

The **2015 Proppant Market Report** is a detailed overview of the 2015 proppant industry in relation to prior years. Market intelligence has been gathered from a variety of industry resources which include historical PropTester, Inc. and KELRIK, LLC databases, key pressure pumping and operator personnel, logistics providers, proppant suppliers and other public and private resources.

Primary information is received directly from proppant manufacturers. Specifically, we solicit proppant produced and supplied to industry by individual proppant manufacturers each calendar year. Although this data is used to compile total proppant supply estimates, specific proppant supplier's sales are not disclosed. In cases where specific disclosures are not available, we have been able to cross reference much of the individual North American data by other means. These include, but are not limited to, public company disclosures, regu d pumping pressure company metrics. Due to presented may include inventories that have yet t tories from prior year.

2015 Report Summary

Where feasible, we include an estimated annual proppant capacity for suppliers. A majority of these figures are voluntarily or publicly disclosed by the supplier. Unless noted otherwise, proppant capacities are annualized commencing January 2016. Capacities can and do vary year to year, and this fact must be taken into consideration when reviewing this information. Operating conditions, mid-year capacity expansions or plant closures, market diversification or substitution, logistical constraints and product demand mix impact functional capacity. This is particularly the case with natural sand producers, where product mix and deposit yield impact gradation availability and production efficiencies. Similarly, resin coat capacity is subject to available substrate supply, whether natural sand or synthetic.

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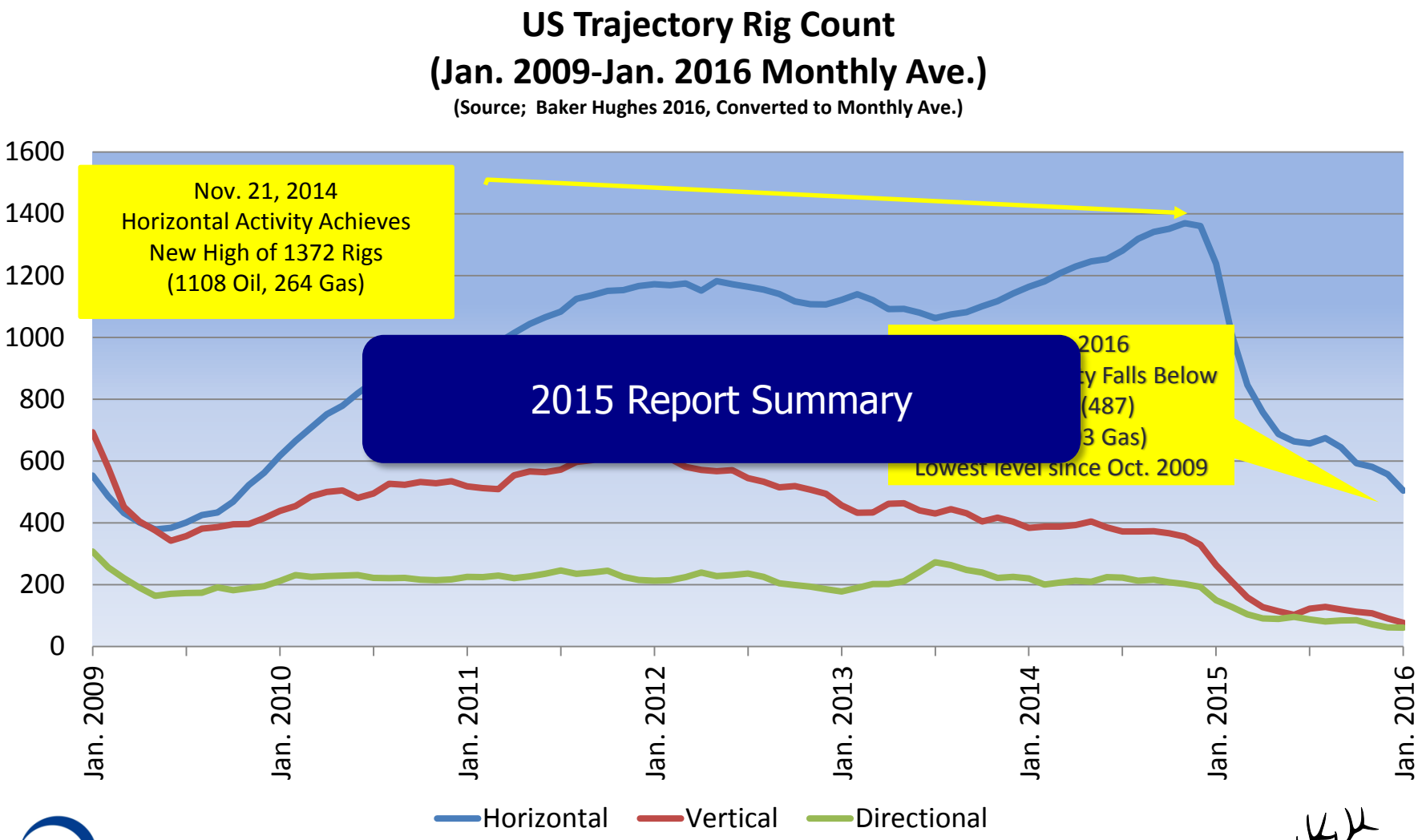
US Oil & Gas Drilling - Trajectory



Key Factors Impacting Proppant Supply

Key Factors	Trend	2015 Outlook
Proppant Type (Ceramic, Sand, Resin, Other)	↑	**See Commentary:** Frac sand and sand substrate for resin coating continues to be the primary proppant type used, and consistently represents over 90 percent of the total proppant market. Although alternative proppants continue to be investigated, sand, ceramic and resin coat are still primary.
Proppant Quality	↑	**See Commentary:** A significant increase in the use of "fit-for-purpose" sands occurred in 2014. Proppant quality expectations typically increase if supply is healthy. During tight supply, lower quality sand and ceramic alternatives often must be employed. In very weak market conditions, however, quality often takes a back seat to cost. New products continue to be developed, ranging from self-suspending proppants to treated sand to mitigate dust.
Mine/Plant Yield (by Mesh Size)	↓	**See Commentary:** The increased use of small mesh sands commencing 2014 improved mine and plant yield, and therefore cost, for many sand companies. In 2015, however, inconsistent demand by proppant size, type and volume affected all proppant segments. This trend negatively impacts plant efficiency, therefore costs, at a time when industry expects (and is receiving) price concessions.
Source Inventory (Location and Reserves)	↔	**See Commentary:** Increased proppant consumption has reduced existing mine life, resulting in a rush to secure additional raw materials which may or may not be available adjacent to the existing production operations. A majority of proppant raw material sources are already located far from end-use destinations, and an increasing …outlets (i.e., rail). New sources are …ve the same base qualities.
Manufacturing Capacity		…otionally well to a significant increase in …g at over 20% CAGR. Stated annual …ng current capacity, much less future growth, will be challenging if material prices do not rebound. Spare capacity will remain, but effective capacity will shrink as producers idle or close uneconomical facilities.
Logistics Infrastructure (Truck, Rail, Barge, Transload)	↑	**See Commentary:** Logistics constraints eased in 2015, not only due to reduce demand but also due to improved rail infrastructure. Super terminals and unit-trains are no longer the exception, but increasingly the norm at a time when industry demands more volume in a shorter time. Despite the improvements, an industry slowdown poses a whole new set of challenges, particularly involving loaded and unloaded railcars.
Proppant Prices	↓	**See Commentary:** The proppant industry succumbed to pricing pressure in 2015 more than what would be generally expected during the second largest year in terms of total proppant supplied. Price deflation is now reminiscent of the mid 1980s crisis, when sand prices took nearly 15 years to recover. Pricing discipline may be a challenge in a large and diverse supplier base, but selling products below cost is neither healthy or sustainable for this industry.
Regulatory Constraints	↓	**See Commentary:** Regulatory challenges remain, ranging from difficult permitting approvals at the local level, to heightened regulatory restrictions at the county, state/provincial and federal levels. The pumping pressure industry must now also deal with enhanced OSHA restrictions regarding permissible exposure levels of silica due in 2016.

2015 Report Summary

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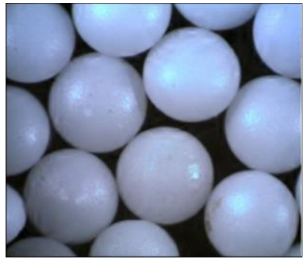
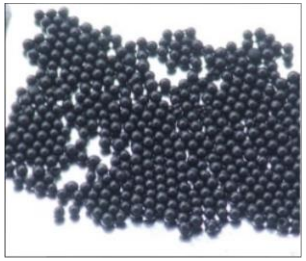
Company	Plant Locations	Source Material	Direct Access	Estimated Realistic Frac Capacity and Noteworthy Events
Preferred Sands **www.preferredsands.com**	Genoa, NB Sanders, AZ Blair, WI Bloomer, WI* *(pending)	Non traditional Bidohachi Wonewoc Wonewoc	UPRR BNSF CNR	**Capacity: 11.00 billion lbs (5,500,000 tons)** **Grades: 12/20 thru 100 M** Preferred Sands produces frac sand currently from three facilities located in Wisconsin, Nebraska and Arizona. The former Woodbury, Minnesota processing plant is now reportedly closed, and the former Hansen Lake (Canada) operation was divested by January 2015 last year. The company has indicated potential to build a new production facility near Bloomer, WI, although no construction is known as of writing. The company also manufactures resin coated sand, as well as DustPRO™, a dust suppression coating, and FloPRO PTT™, a hydrophobic proppant transport additive for self-suspending proppants.
Badger Mining Corp. **www.badgerminingcorp.com**	Taylor, WI Fairwater, WI Alma Center, WI* *Acquired from NFP	Wonewoc St. Peter Wonewoc	CNR WSOR CNR	**Capacity: 8.180 billion lbs (4,090,000 tons)** **Grades: 12/20 thru 100 M** Badger Mining Corp. supplies Northern White sand from three operations located in Wisconsin. In 2015, the company acquired the Northern Frac Proppants, LLC mine and processing plant in Alma Center, WI for an undisclosed sum, expanding estimated frac capacity to over 4 Million tons. Both the Taylor and Alma Center plants are now reportedly unit-train capable sites. The company also manufactures …sin Proppants subsidiaries.
Eagle Materials, Inc. **www.eaglematerials.com** **(Northern White Sand Co. LLC)**	Corpus Christ… New Auburn, … Utica, IL (pen…			…ns) **[Trend: 5.0 Million tons 2017]** …Northern White Sand, LLC commenced frac sand supply mid 2013 in Corpus Christi, TX. During 1Q2015, the company doubled the capacity of the New Auburn, WI facility, which it acquired from CRS Proppants in 2014, to 2 Million tpy. The company has yet to construct an estimated 1.5 Million tpy dry processing plant near its existing Utica, Il mine and wash plant.
EOG Resources, Inc. **www.eogresources.com**	Chippewa Falls, WI Ft. Spunky, Hood Cty., TX Rawhide, Hood Cty., TX Bulcher, TX* *Pending site	Wonewoc Paluxy Non traditional Non traditional	Short line Truck Truck Truck	**Capacity: 6.000 billion lbs (3,000,000 tons)** **Grades: 16/30 thru 200 M** EOG Resources (NYSE: EOG) is credited as the first E&P company to vertically integrate sand supply using a source in Hood County near Cleburne, TX. The Chippewa Falls , WI processing plant became operational in December 2011 utilizing resources from multiple Wonewoc sandstone mines. The Rawhide plant, which is located near the Ft. Spunky plant, currently processes regional 100 mesh. Status of a pending new plant in Cooke Country, Texas near Bulcher and St. Joe is to be determined.

2015 Report Summary

Basic Ceramic/Synthetic Proppant Types

Ultra-High Density	High Density	Intermediate	Lightweight	Ultra Lightweight
				
• ~ 2.30 g/cm^3 • > 145 lb/ft^3	• ~ 2.00 g/cm^3 • > 127 lb/ft^3	• ~1.80 g/cm^3 • ~ 117 lb/ft^3	• ~1.60 g/cm^3 • ~100 lb/ft^3	• ~1.20 g/cm^3 • < 80 lb/ft^3

2015 Report Summary

Rail Logistics Challenges (Weak Market)

Origin

- Proppant demand slows, then weakens, commencing 2Q2015
  - Surplus proppant capacity swells
  - Railcar shortage diminishes
- Proppant prices increasingly drive purchasing decisions
  - Increased utilization of lower cost or regional sources (more fine grades)
  - Increasingly inconsistent proppant demand at many rail-based suppliers

Transit

- Proppant demand slows, then weakens, commencing 2Q2105
  - Origin storage capacity, production and loading efficiencies compromised
  - Surplus rail[illegible] costs up
- Shipping co[illegible]sions
  - Suppliers i[illegible]
  - Unit-trains[illegible]

2015 Report Summary

In-Basin

- Proppant demand slows, then weakens, commencing 2Q2015
  - Destination carrying capacity strained and demand inconsistent
  - In-basin inventories swell; demurrage and constructive placement
- In-basin orders increasingly auction-like (bidding jobs)
  - Delivery windows tightened (haves and have nots)
  - Forecasting compromised

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