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BEECHWOOD COAL REAPS BENEFITS FROM ACCELERATOR PROCESSING

Appalachian coal operator uses an alternative method to selectively crush raw coal

BY RON TSCHANTZ



Built in the 1970s, Beechwood Coal Co.'s Lonaconing tipple has a raw feed capacity of up to 600 tph.

Nestled in the western panhandle of Maryland in the Northern Appalachian region is a quaint, rural community known as Lonaconing. This coal-bearing area, also known as Georges Creek Coal Basin, lies in the western part of Allegany and eastern Garrett counties, and is named after an Indian chief called George who canoed the Savage River.

From the late 1800s and into the 20th century, Consolidation Coal Co. deep mined the Big Vein (Pittsburgh No. 8, a coal seam up to 14 ft thick) in Georges Creek. This predominately mined seam, hand-dug and hauled by horse and mule from the deep mines, was the chief source of Maryland coal production for almost a century. This coal was shipped east to the Potomac River power station to generate electricity for the White House and surrounding Washington, D.C., area. It was also used as fuel to power U.S. Navy warships during World War I.

Jody Ritchie, principal owner of Beechwood Coal Co., started in 1999 as a general contractor near Frostburg, 15 miles north of Lonaconing. Ritchie, along with his wife Faith, ran their trucking company, Ritchie Trucking, performing contract construction services including excavating, construction and

re-vegetation services for mine reclamation. As the business grew, it began contract surface mining and hauled coal for the Buffalo Coal Co. and others.

In 2007, Ritchie purchased Buffalo Coal Co.'s Lonaconing tipple and formed Beechwood Coal Co. The entire facility sat abandoned for several years before they purchased it from bankruptcy court. "Run down, and scavenged by thieves, the facility was in need of repair," Ritchie said. "It is, however, one of only two wash plants permitted in Maryland, and is the only permitted wash plant in Georges Creek with an adequate water supply."

Built in the 1970s, the facility has a 150 ton per hour (tph) modular hydrocyclone plant that washes coal at 1.45 specific gravity with a 1-¼-inch, top-size feed. In the early 1990s, Buffalo Coal Co. (under the auspices of Jerry Duckett, manager of coal preparation) modified the Lonaconing facility by removing an old, three-story wooden tipple previously used for loading sized house coal. It was replaced with a 150-ton coal bin, 8- x 16-ft Tabor screen (supported from the original wooden tipples' concrete piers), an Accelerator, a Midwestern screen with related conveyors and a truck drive-under reject bin.

The Accelerator is a variable speed vertical impact breaker produced by Imperial Technologies. It has two 15-hp variable speed Drive Source drives. Beneath the Accelerator is a Midwestern Uni-Rod coal recovery screen with two 7.5-hp motors.

Duckett validated the ability of the Accelerator to improve coal quality based on performance by testing coals at another Accelerator site. The Accelerator with a screening system improved coal quality and the ability to process multiple seams of coal to a controlled top size, which could be blended with or without washed and/or crop coal to meet the specifications of utilities and industrial customers.

"Since the purchase, we have been fixing and improving these facilities little by little as we can and we are working hard to be a viable and reliable supplier by delivering quality coals for our customers, who request a 2-inch x 0 finished product," Ritchie said.

Processing Regional Coals

The wash plant, raw and washed coal storage, certified truck scale with raw coal sizing and quality enhancement system, and processed coal storage facilities for load-out are split into four tiers on the side of the mountain in Lonaconing.

The hydrocyclone wash plant is located on the top tier. The third tier has a large coal storage area, or commons, to receive and stockpile washed coal via conveyor from the wash plant and raw coals delivered by trucks from the various pits and mining operations. The second tier has the truck scales and the screening

and Accelerator system. The first, bottom tier, is reserved for processed coal and storage for shipment to customers.

On a monthly basis, Beechwood Coal Co. mines and processes more than 30,000 tons of coal from their mining operations and also purchases some raw coal from other mining companies. At any one time, there may be as many as seven different raw coals available for processing and blending in various ratios, to achieve a specific product analysis.

Regardless of the origination, all coals are weighed by the certified truck scale as they come on-site and are dumped in specific stockpiles either at the wash plant or at the raw coal storage-staging area. The qualities of coals received vary by calorific value (Btu/lb), ash and sulfur. The local seams include the Redstone, Barton, Franklin, Waynesburg, Morantown, Big Vein (the most prolific seam), Little Pittsburgh and the Sewickley/Tyson. The Big Vein has a hard parting that typically measures from 4- to 6-inches thick with some carbonaceous shale and bone. In addition, crop coal and what Ritchie refers to as BV rations, which are low in sulfur, calorific value and ash, are also available for blending with higher sulfur coals to produce a lower sulfur product.

“Many of the raw coal seams delivered are not of marketable quality by themselves,” Ritchie said. “Most of our coal is a low-volatile coal, ranging from 70 to 100 on the Hardgrove Grindability Index (HGI). For some orders, certain raw coals may only need to be processed through the Accelerator to a 2-inch top size with removal of oversized high ash and pyritic impurities to meet specifications. This process sometimes eliminates the need for washed coal blending. We also have other industrial customers that specifically require washed coals.”

Beechwood Coal is able to market a customized quality of coal by blending raw coal processed through the Accelerator with washed coal. This processing method allows Beechwood to take non-marketable coals and turn them into higher quality, marketable coals that meet or exceed their customers' required quality and size specifications.

“We do not use a crusher to crush everything,” Ritchie said. “The Accelerator processed coal is of higher quality than just crushed coal. We only wash as much coal as needed to blend with Accelerator processed coal to meet customer requirements. This reduces the amount of washed coal required for blending and helps keep our overall costs down.”

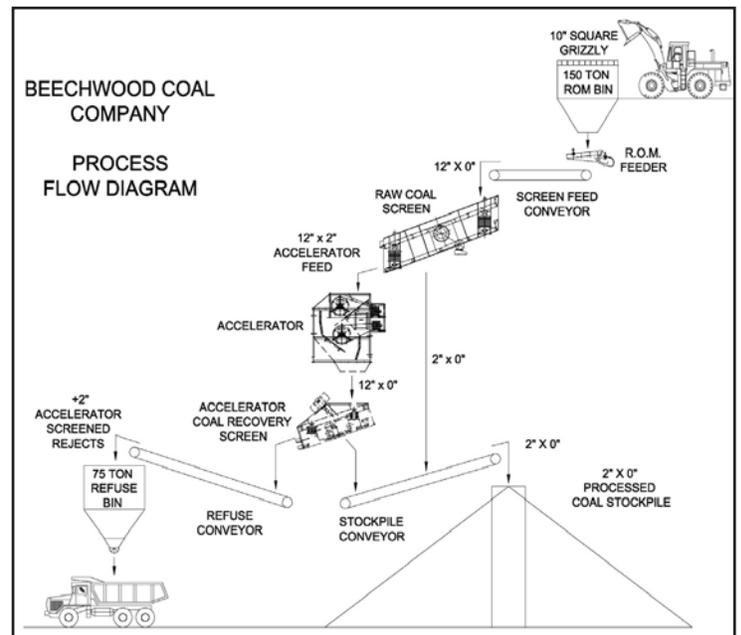
The Blending Process

Before any coals are processed, an outside lab samples the raw coals and washed coal. The analytical data and weight tickets from the truck scale deliveries allow Beechwood to determine the appropriate computerized raw, raw with raw, and raw with washed-coal blends needed to meet customer specifications at the lowest cost. Sampling is repeated thereafter to validate that the processed coal meets customer quality specifications and requirements.

“We used to have our own lab to analyze coals, but now it is more cost effective and required by our customers to have an ASTM independent, certified lab validate the coal quality,” Ritchie said. “We pay our coal suppliers on the delivered analysis and receive payment from our customers based on their certified ‘as received’ analysis.”

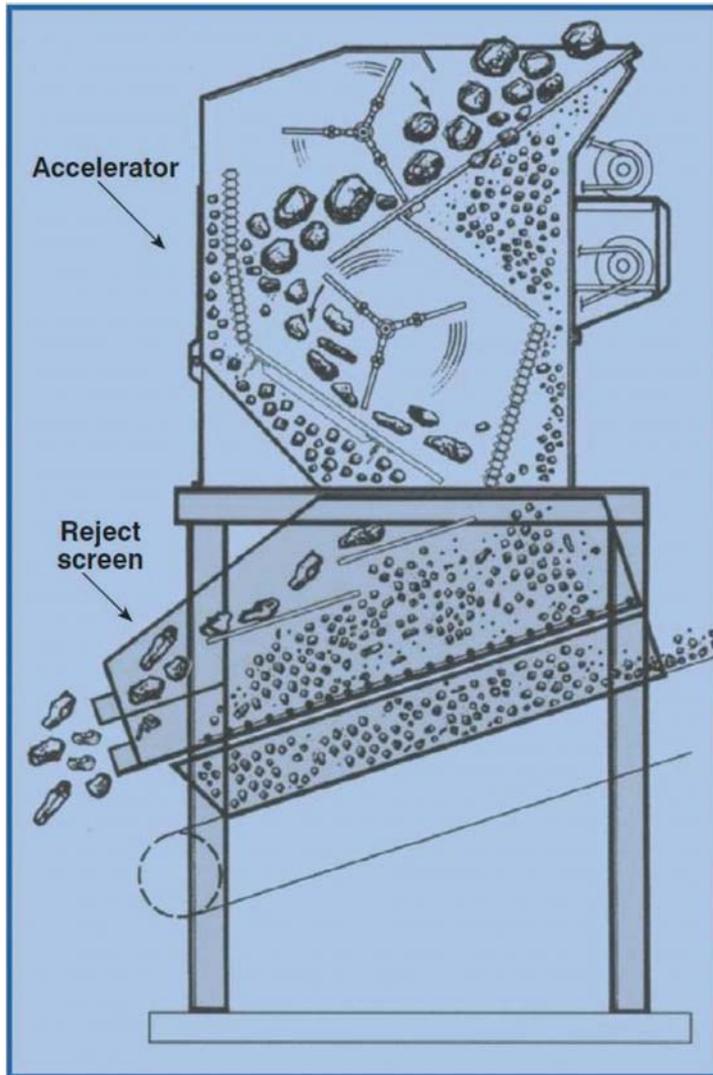


The Accelerator sits below an 8- x 16-ft Tabor screen.



For each customer order, the delivery weight tickets and lab analysis are used to determine the types and amounts of coals to be selected from the specifically marked coal stockpiles. A front-end loader systematically dumps buckets of the selected coals into the 150-ton capacity blending bin. The 150-ton bin has a 10-inch square grizzly that can also receive direct delivery by truck. The bin and grizzly were designed to support the weight of a front-end loader, which can break up any oversized coal chunks through the grizzly into the bin or to scrape off large rocks.

The blending bin was intentionally designed with approximately 70° sloped sides and lined with stainless steel to prevent material from sticking to the bin sides or plugging the bin. A vibrating feeder under the bin delivers a consistent and controlled feed of material at a variable feed rate ranging up to 600 tph onto a 36-inch decline conveyor. The decline conveyor discharges onto an 8- x 16-ft, single-deck Tabor screen, located at the second-tier elevation. This screen has 2-inch stainless steel cloth openings on the upper 8-ft section and 1-1/2-inch openings on the lower screen section.



The impact breakage in the Accelerator is adjusted by variable speed controls to selectively fracture the coal.

Depending on the coal seam or seams being blended to be processed, up to 70% of the friable and sized coal may pass through the screen directly onto the collecting conveyor below. The 12- x 2-inch oversized material vibrates over the bottom section of the screen, discharging into the Accelerator.

The impact breakage in the Accelerator is adjusted by the variable speed controls to selectively fracture the coal to a 2-inch x 0 sized product while minimizing breakage of the denser, harder impurities. Oversized shale partings, pyritic rock and other impurities are then rejected across a Midwestern Uni-Rod screen with 2-inch wire cloth apertures. The Accelerator-processed, correctly-sized material passes through the Midwestern screen and

rejoins the pre-screened material from the Tabor screen on the collecting conveyor for stockpiling.

The oversized and foreign plus 2-inch material that passes through the Accelerator and is rejected by the Midwestern screen reports onto a conveyor to a 75-ton truck refuse load-out bin for disposal. The reject consists of oversized shale partings, carbonaceous shale and bone, pyrites, sandstone rock, mine timbers, hand-held drill bits, pick heads and shovels, pieces of rail used to move the horse drawn coal cars in the mine, and any other debris left in the hand-dug deep mines.

Ritchie prefers the Accelerator over a rotary breaker because he can tailor the processing of each type of coal separately through the Accelerator. The simplicity of the variable speed control of the Accelerator allows Beechwood to more effectively control and quickly fine-tune the coal impact breakage for each specific coal seam (low or high HGI coals) as well as frozen coal, while rejecting oversized impurities.

“During freezing winter conditions, we can process wet or frozen coal more effectively with the Accelerator than with a rotary breaker,” Ritchie said. Unwashed wet coal containing clay sticks and freezes to the inside of the rotary breaker. That slow buildup cushions the impact and results in inefficient coal breakage.

“During those three to four months of freezing conditions, it was difficult to keep the rotary breaker screen plates and slope sheets from plugging, resulting in the loss of coal with the reject,” Ritchie said. “With the Accelerator’s operation, the material moves through the unit quickly, so that it doesn’t have the retention time as in a rotary breaker to stick and freeze. We can adjust the rotor speeds instantly during operation, for higher or lower impact breakage. I love it for processing!”

Ritchie also likes the Accelerator better than a crusher for other reasons. “We can decrease the ash content and size of our coal product without crushing everything,” Ritchie said. “Crushed shale and rock reduces the Btus [calorific value] by increasing ash in the product. The Accelerator makes fewer fines and requires less maintenance. We don’t have to have a welder come in over the weekends to weld nubs onto crusher rolls.”

Randy Deal, wash plant superintendent, agrees on the maintenance benefits. “We can change out a set of Accelerator impact grids in about 20 minutes and can replace a complete set of rotor flails in about an hour,” Deal said. “Wear-component replacements may only need to be done once or twice a year; generally once a year.”

Through the use of the Accelerator and by blending various coal types, Beechwood Coal has developed a low-cost operating advantage by producing higher quality coal products to more efficiently meet the unique needs of each of its customers.

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