



Light Shining Bright at Tunnel Ridge

AN efficient workforce, the latest in technology and a robust coal seam to boot – Alliance Resource Partners’ Tunnel Ridge mine in northern Appalachia has it all. **Donna Caudill** recently visited the mine for *CoalUSA Magazine*.



Courtesy Bob Hower, Quadrant, Inc



Tunnel Ridge, currently in development, is set to open in early 2012

Set to open in early 2012 at 5.5 million tons per annum following the final finishing touches of its development, Tunnel Ridge is not even in full production mode yet and it is already making a name for itself as one of the most anticipated new longwall operations. After securing a reserve in excess of 70 million tons in the Pittsburgh 8 seam – a rare feat in itself – development at the West Virginia mine’s Walker Slope was announced in September 2008.

The mine complex covers 9400 acres and has the distinction of being a two-state property – over its lifespan crews will mine in Ohio County in northern West Virginia and Washington County in southwestern Pennsylvania.

As it awaits a newly built mine portal complex at the Battle Run Shaft to be completed – a new bathhouse for the workforce was recently installed – it is working from existing administrative offices, a mine rescue station and health center (see sidebar) at the Battle Run site.

Because the Pittsburgh 8 seam outcrops just west of the reserve, range of overburden varies a bit at Tunnel Ridge but averages between 425 feet and 675ft. Seam height is

TUNNEL RIDGE MINE

- OWNER: Alliance Resource Partners
- LOCATION: Triadelphia, West Virginia
- SEAM NAME: Pittsburgh 8
- DATE STARTED: September 2008
- ANTICIPATED LONGWALL START: 1Q12
- FLEET INCLUDES: Alliance JSST-1020 shields, Joy and Longwall Associates on longwall AFC; Joy CM units; Auxier Welding shuttle cars and feeders, Fairchild and Bucyrus scoops, MCI and Line Power high voltage equipment, Matrix Design communications and tracking, FMC conveyors
- STAFF: 85 underground/100 total at current, 350 total by 2012

a healthy 66-72 inches while cutting height is 68-72in; roof coal left on in development will help to seal and support the roof.

Management is carefully completing its due diligence obligations as it develops in this area, which is known for its past mining activity.

Because the operation will be accessing an 800-1000ft wide corridor between the former Valley Camp and Windsor Coal complex, and because so many older mine maps cannot be verified as completely accurate, the company is working with REI Drilling to drill ahead of mining to ensure crews don’t get too close to these adjacent workings.

Once development underground reaches the Battle Run shaft, personnel will access the coal seam through that site to reduce travel time.

As the mine’s development mode continues, the trip underground is a short 15 minutes via one of its personnel carrier fleet units that includes Damascus, Johnson Industries and Pillar Innovations EMU units along with a Brookville diesel mantrip.

Traveling the gradual descent of the slope, it is hard not to notice the roof control support plan followed by Tunnel Ridge, which includes a standard roof bolt pattern ►



Alliance Health Centers

Hermiet Van Laar at the Tunnel Ridge clinic, one of 12 locations at Alliance mines
Courtesy Bob Hower, Quadrant, Inc

ALLIANCE Resource Partners has created what could be a model for the future of healthcare in the mining industry, with a network of health clinics available to workers and their families.

Miners, their spouses and their dependent children are all eligible to visit any of the 12 clinics managed by Raymond D Wells, PSC, located at all Alliance operations as well as the producer's corporate headquarters in Tulsa, Oklahoma, and operations headquarters in Lexington, Kentucky.

The medical staff, including Hermiet Van Laar at the Tunnel Ridge clinic, perform many standard tests and procedures that would cost patients, both in co-payments and time, under other circumstances. Appointments and walk-ins are accepted, and every location has a diverse range of services including physical exams, diagnostic tests and blood work, injections and immunizations, and monitoring of chronic conditions such as cardiac issues and high blood pressure.

When an illness or condition does arise in a miner's family, various over-the-counter and prescription medications from cough medicine to diabetic supplies are available at no cost. Even women's health, EKG testing and pre-employment exam needs are met by the expert staff at each clinic.

In 2010, more than 20,000 patients were seen by one of two physicians, six nurse practitioners and other skilled medical professionals across all of the locations, and more than 4100 were seen on more than one occasion. For every one of these visits, which are without cost to the individual, the company also simultaneously realized a savings to the overall standard health

benefit plan offered by ARLP.

Over the year, the clinics performed more than 67,000 medical procedures onsite. The clinics are all well-networked with local hospitals and specialist care providers, ensuring that an in-office diagnosis can be forwarded to a specialist and a referral visit secured faster than through the regular channels of the healthcare system.

Van Laar and the group's other medical professionals can also offer input and consult on a patient using the latest in video conferencing technology with a system installed right in the examination room. If an individual were to visit with a work-related laceration injury, the physician based at ARLP's operations headquarters in Kentucky could look at the condition in high definition and help determine the best treatment; such rapid treatment may even help to keep an injury from becoming a lost-time incident.

The clinics have come a long way in five years, when everything began with a single traveling nurse. The group now offers a network to answer any questions by ARLP employees and their families, and also offers annual health fairs at every location to allow individuals to receive a complete health review and follow up on any issues.

Van Laar joined the Tunnel Ridge Health Center when it was established in July 2009, and the patient list grew again once mining production officially commenced last March. With more than 1500 individual visits at the Tunnel Ridge facility logged in 2010, the office realized a rapid return on its financial investment while giving invaluable peace of mind to its all-important patients.

supplemented with steel straps, welded wire mesh, rib bolts and cable bolts. While officials report no significant issues with roof control as a whole, general manager Randy Riddle noted that the design decision was made to proactively protect everyone from what can be a common problem for other Pittsburgh 8 mines.

Additionally, he said, the move is part of a common practice by all Alliance mines to go above and beyond compliance regulations to protect employees and the long-term viability of the mines. Many of the areas being developed now are considered "life of mine" entries and travelways that will need to stand the test of time through decades of production life.

The mine's immediate roof, according to Riddle, is typical for the Pittsburgh seam and is comprised of shale overlain by 8-12ft of limestone. At the floor is 6-10in of fireclay, while clastic dikes (or clay veins) are present on occasion, and in those areas broken, highly slickensided and wet conditions can be found.

With prime production levels still several months away, Tunnel Ridge is actively preparing for another common NAPP issue – gas.

Riddle said CH₄ is a consistent concern, but is one the company will manage with strict compliance to federal and state laws through the most effective mining practices. At this point, he expects medium to low levels of CH₄, and noted that everyone is very well prepared.

As crews grow nearer to the mine's first longwall panel, the hardware needed to outfit it is, not surprisingly, of cutting-edge quality – much like so many other product and equipment choices being made at the operation. A new Joy 7 LS1A shearer with a 62in drum and 1625HP of installed power will make easy work of chewing coal from the face, where it will fall onto a Joy face conveyor system with a 1m wide, 42mm belt paired with Thiele chain sprinting along at 342 feet per minute under the power of Baldor/Reliance motors.

Add to that the strength of a line-up of sturdy shields, management has selected 1.75m wide, two-legged shields with yield loads of 400bar or 5800 pounds per square inch and Tiefenbach controls.

The BSL and crusher have also been provided by Joy, operating at 4000tph and with a belt-driven crusher. Clearance by design is 3in.

One of the unique design factors of Tunnel Ridge is the tremendous length of its longwall panels.

Panel widths will be average for the region at 1000ft, but the design of the mine has

INDUSTRY FOCUS

allowed for lengths of 20,000ft to as much as 22,000ft.

The reason, according to Riddle, is simple – efficiency. Longer longwall panels mean that longwall moves are necessary on a less frequent basis, and thus production uptime can increase.

Additionally, crews using the mine's Joy 12C/M and 14C/M miners can concentrate fully on driving the upcoming panel, allowing for a more harmonious logistical relationship with regard to equipment and resource needs.

So, will Tunnel Ridge be the wave of the future of longwall mining? Mine officials answer in the affirmative, with plans for a “man-assisted” face; meaning the longwall will be fully automated with crews monitoring performance.

The decidedly infrequent panel moves have already been outlined by the mine's management, with eleven days total allotted for the needed longwall moves. No bolt-up processes have yet been outlined.

One factor of mining at Tunnel Ridge that is set in stone – and, after more than two years running, has become a science for its crews – is development. The entire staff has been careful with all decisions considering the reserve skirts two old mine workings, but work at the three-entry operation is also progressing with gusto and no shortage of well-calculated decisions.

Crews on both current shift groups (known as the A, B, C, D Crews) are working 12-hour shifts on a 4 days on, 4 days off roster, with the mine producing on a 24/7 basis. The crews have maintained a consistent 95% equipment availability average on development equipment, something considered a notable achievement even for a long-standing older mine. Place change and full face mining methods are both utilized.

The term cutting-edge becomes literal when examining roadway and pillar dimensions at Tunnel Ridge, which have been deliberately designed at 200x50ft. Riddle said the decision was efficiency-based.

“Management decided to increase crosscut centers to expedite longwall development,” he said, and noted that they will not return to those areas to mine the coal from those pillars.

With prime production levels expected to be in the range of 5.5Mtpa, Tunnel Ridge has taken great care to design a progressive conveyor infrastructure. The belts, which are all powered by variable frequency drives, are having no problem with the production coal being extracted and management projects no bottlenecking issues even when ramped up.

An assessment of safety, considered to be priority one for Alliance management and



*The mine currently has 85 underground staff (100 total), with 350 expected by its opening
Courtesy Bob Hower, Quadrant, Inc*

mines alike, was the main consideration for the Tunnel Ridge ventilation plan, which is centered around portable fans with tubing on the sections. Sometimes an expensive avenue for larger mines to take, Riddle said that the safety of workers who can avoid working near the line curtain that would be needed

otherwise, along with keeping the roof bolt crews out of the dust, was the ultimate return on investment for the producer and was an easy decision.

The vent circuit is installed to grow with the mine, and thus for development is a temporary design. Once the longwall ►

TUNNEL RIDGE WASHING, PREPARATION AND DELIVERY

- Heavy media circuits
- 1800tph wash plant capacity
- Delivery from mine via overland conveyor
- Delivery to steam power generation stations via Ohio River barge fleet



Coal is taken from the mine via overland conveyor, prepared and delivered via Ohio River barge fleet
Courtesy Bob Hower, Quadrant, Inc

commences production, the transitory 200HP main fan will be changed out with an 8ft, 2000HP exhausting fan with a 1000HP bleeder fan.

Also growing as mine crew numbers rise, but already a solid function, is the mine's maintenance outline. Preventative-maintenance based and time/ton driven, a crew of two maintenance managers and two mechanics each shift (two of whom come from backgrounds as Joy Mining service representatives) are keeping things running day-to-day, and because these individuals are on two 12-hour shifts, the mine is never without a maintenance expert to keep Tunnel Ridge in top shape.

"Our operating section has redundant equipment so our maintenance crews can schedule equipment idle for maintenance when necessary," Riddle said.

Tunnel Ridge can be compared to the opening night of a popular play, with the curtain drawn back slightly to reveal a tightly-knit and young crew of miners, which currently total 85 of its approximately 100-worker group.

As the curtain of production rises with the startup of the longwall, so will staff numbers

The Matrix role

ALLIANCE Resource Partners purchased Matrix Design Group, LLC, an engineering firm specializing in controls and automation, in 2006. Today, Matrix still provides cutting-edge controls and automation, but has branched out to provide the latest in communications, tracking, atmospheric monitoring and proximity detection systems to mines nationwide.

The partnership between Matrix and

ARLP has been a wise one that has kept Alliance's entire mining portfolio a step ahead of the technological curve.

At Tunnel Ridge, Matrix provides the products behind its MSHA-approved communications, tracking, atmospheric monitoring and proximity detection systems, as well as the controls and automation expertise behind its state-of-the-art conveyor systems.

– to a projected 350 workers combined at the surface and underground.

Management views its biggest obstacle to be a common one for the overall industry, particularly in Appalachia: the ongoing worker shortage that is leaving mines scrambling for experienced operators.

However, this small crew has so far demonstrated a great ability to further develop and produce coal while maintaining a high level of safe practices; it received a Mountaineer Guardian Award from the state

of West Virginia in February for its 1.04 non-fatal days lost rate (one lost-time accident) in 2010.

"We have always considered one of our greatest assets to be the skilled and dedicated workforces at each of our operations," Alliance operations vice president Ted Norris said.

"We anticipate the same at Tunnel Ridge, and by the early results seen both in safety and accomplishments during the development phase we are excited about the direction Tunnel Ridge is headed." CU