
Virginia Department of Mines, Minerals, and Energy
Division of Mines

Accident Investigation Report
Underground Coal Mine

Geologic Bump / Methane Ignition / Fire
July 9, 2007
To
February 12, 2008

Consolidation Coal Company
Buchanan Mine No. 1
Buchanan County, Virginia
Virginia Mine Index Number 11912AA

REPORT RELEASE DATE: October 24, 2008

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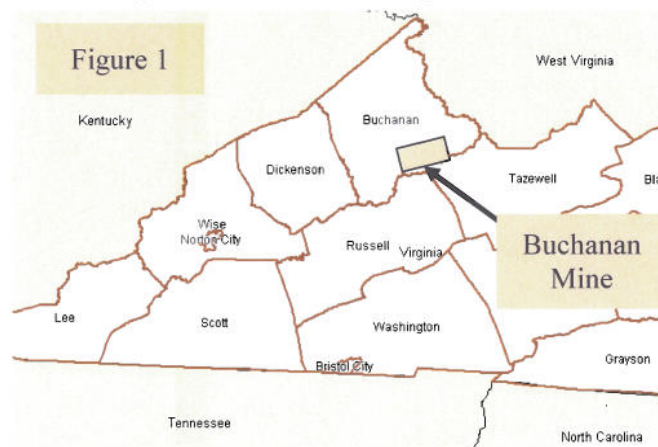
Geologic Bump / Methane Ignition / Mine Fire Investigation
Consolidation Coal Company
Buchanan Mine Number 1
Virginia Mine Index Number 11912AA

EXECUTIVE SUMMARY

At approximately 9:43 a.m. on July 9, 2007, a sudden energy release caused an underground shock bump and roof fall in the 9 Right off 3 East Mains longwall gob area. Breaking of a thick sandstone layer just above the coal seam is believed to have caused the energy release. The effects of the bump were seen and felt on the 9 Right longwall face and along the 3 East Mains trackway. The bump/roof fall likely initiated a methane gas ignition in the active gob area. The air blast of the roof fall and expanding gases of the ignition caused an inundation of dust on the longwall face and 3 East trackway, brief air reversal on the longwall face, and CO alarms on the 3 East trackway. Due to these circumstances, management officials directed a mine wide evacuation. Carbon monoxide readings climbed to significant levels and continued to fluctuate at various locations in and around the 3 East gob. Nitrogen injection began on July 15, 2007. Nitrogen injection and gas sampling continued until September 26, 2007, when injection was halted to evaluate the stability of the mine atmosphere. Nitrogen injection resumed on September 30 once the gas samples indicated carbon monoxide was still being produced. The mine was sealed November 27, 2007, using various methods. The intake shafts, including the intake side of split shafts, were sealed with metal caps and return shafts and fan housings were sealed with inflatable bladders. Following unsealing and exploration by mine rescue teams, ventilation was reestablished and the longwall resumed production on March 15, 2008. Two geologic conditions have been found to cause the occurrence of bumps in the eastern United States: (1) relatively thick overburden and (2) extremely rigid strata occurring immediately above and below the mine coalbed. The Buchanan Mine is located in an area of thick overburden and the roof is comprised of relatively strong shale, sandstone, and sandy shale. There are two distinct sandstone layers present in the mine roof. These sandstone layers have sometimes been found to merge into one very rigid layer that may be from zero to seventy feet thick. The redesign of the mine's panel layout to 700 feet wide panels and modified pillar design will enhance stability and may eliminate future seismic events.

COMMENTARY

CONSOL Energy, a Pittsburgh Pennsylvania based corporation, is the parent company of CNX Coal. CNX Coal currently operates 17 mining complexes in the United States, one of which is a large longwall operation in Southwest Virginia. The Buchanan Mine penetrates and develops coal reserves of the Pocahontas 3 Seam that averages 72 inches in total mining height and is 1,550 to 2,175 feet below local topography. The Buchanan Mine, Mine Index # 11912AA, is located in the southeastern portion of Buchanan County, Virginia (Figure 1). In July 2007, individuals responsible for mine management included Kenneth Harvey, Superintendent; Craig Chadwell, Assistant Superintendent; Leonard Clarkson, Mine Foreman; Archie Ruble, Ventilation Foreman; Bill Fisher, Mine Engineer; and Kim Noah, Safety Supervisor.



This operation typically employs 525 miners of which approximately 460 are underground workers and the remaining are surface workers. The mine complex is open seven days per week, twenty-four hours per day and includes three production shifts per day. Daily production averages between 17,000 and 20,000 tons of raw coal material. This level of production is achieved from three “super-sections” on panel development and one retreat longwall unit. The super-section development is designed to support longwall unit production and maximize coal recovery. In the current district, longwall panels are 980 feet wide and 11,500 feet in length. The district plan included ten longwall panels and at the time of the incident, the longwall unit was on the ninth panel and had completed 9,400 feet of the 9-right panel off 3 East Mains.

In July 2007, the mine had ten ventilation shafts, two of which are used to transport miners in and out of the mine; one adjacent to State Route 632 in the community of Mavisdale and another along State Route 680 on Contrary Road. The operation utilizes six large exhausting ventilation fans that move over 3 million cubic feet of air per minute through the mine air courses to provide fresh air to workers underground and to render harmless and carry away mine gases. During 1999, atmospheric monitoring indicated the mine averaged 12.3 million cubic feet of methane per day through the mine fans. This volume has steadily declined over the past seven years with an average of just over 8.7

million cubic feet per day currently being reported. Through designed longwall panel degassing and planned coalbed methane wells from the surface, coal operations work diligently to flush and capture coalbed methane ahead of underground panel development and longwall retreat. Controlled subsidence from longwall mining creates natural fractures for coalbed methane removal from the “gob” areas. Gob wells (or vertical degasification boreholes) assist in controlling the mine atmosphere throughout the longwall district and prevent excess accumulation of methane gas throughout the underground air courses.

DESCRIPTION OF THE EVENT

On the morning of July 9, 2007 at approximately 9:15 am, the dayshift longwall crew had taken over from the owl shift and finished a run from near mid-face to the head on the 9 Right Longwall. The crew consisted of Scott Honaker, Acting Foreman; Jeff Begley, Maintenance Foreman; Danny Vandyke and Terry Hurley, Electricians; Wade Quesenberry, Dennis Ward, and Mike McGlothin, Jacksetters; and David McKinney and Mark Daniel; Shearer Operators. At 9:43 am, while they were servicing and removing belt and monorail, the crew felt an abnormally large bump. A second bump was felt at 9:45 am and the crew noticed that the airflow on the longwall face had been reversed and they could see a cloud of dust coming toward them from the tailgate. The reversal lasted approximately 5 or 10 seconds. McGlothin had been in the #3 entry approximately 40 to 50 feet outby the check curtains when the bumps occurred. He reported that air from the gob raised the check curtains for 10 or 12 seconds before being sucked back into place. This happened a second time and he reported that the air seemed to stand still. Quesenberry had been outby the face unloading monorail when he felt the bumps and saw dust coming up the track. McGlothin and Quesenberry rejoined the crew and Honaker ordered everyone to the intake with SCSRs. Finding the intake entry to be dustier, Honaker and the crew returned to the track entry. Honaker called out on the phone as the crew loaded up on the mantrip. They checked the intake once more, determined that it was still dusty, and departed on the mantrip down 3 East Mains to the 8 Vent elevator.

Barbara Justice, Security / Atmospheric Monitoring System (AMS) Operator, was on duty when the AMS gave an over range alarm at 9:48 am. When she checked the alarm, she found a reading of 50.61 parts per million (ppm) for the sensor located at 3 East Mains Break 62. Immediately she began paging for a responsible person on the mine phone. Craig Chadwell, Assistant Superintendent; Leonard

Clarkson, Mine Foreman; Archie Ruble, Ventilation Foreman; and Calvin Green, Degas Coordinator were arriving at the bottom of Vent Shaft 8 on the elevator when they heard Barbara paging. Ruble went to answer the phone while the others went toward the mantrips. Barbara informed Ruble about the alarm. At the same time, the 9 Right Belt head Person, Mike Dillow, informed Ruble that he had felt two bumps and saw dust coming up the track. Ruble left Green at the phone to contact miners. Green instructed the miners to travel to their escape ways near a phone and await additional instructions.

During the time when Ruble was initially answering the call from security, Chadwell had taken a mantrip and proceeded to 4 North Mains. He noticed the belts were not running and stopped at the 3 East #1 belt head to use the phone to determine the problem. John Beasley, Belt Coordinator, informed Chadwell that there had been a disruption to the ventilation and the belts had been de-energized. Chadwell also overheard orders being given for personnel to go to the intake and he instructed the section foremen to take air readings on their sections. One or two minutes later, Chadwell was notified by security that there appeared to be smoke coming from the #9 Ventilation Shaft. Chadwell then overheard Ruble on the mine phone giving orders to evacuate the mine. Chadwell then called Bill Meade, General Superintendent, at the Oakwood office to inform him of the situation. Meade instructed Chadwell to check "7 East" (meaning 3 East Mains 7 Right panel). Chadwell began working toward 7 Right switching out with the oncoming traffic that was evacuating the mine. As he proceeded, Chadwell enlisted the help of foremen Eric Smith, Jeff Begley, Ray Kinder, and Rick Steele.

Immediately after receiving the call from Chadwell, Meade notified Danny Quesenberry, Superintendent of Special Projects, and proceeded to the 9 Right Ventilation Shaft. Meade, Quesenberry, and Kelly Gilmer (Senior Project Engineer) arrived at 9 Vent at the same time. Meade saw a "light dust" in the air and smelled burning wood. He also examined the fan chart and saw a drop of 3 to 5 inches. He then left for the Contrary mine office. Later he found out that loose wood had been burned on the surface near 9 Vent on the previous day.

Larry Laforce was the section foreman on the 11 Right section at the time of the incident. Laforce was outby with some men he had instructed to fill the water car and pick up trash when he was met by John Hughes, MSHA inspector. Hughes had been conducting a noise survey on the section when he "briefly" felt a "slight" pressure change. During this time, the crew received instructions to travel to their escapeway. When they reached the phone in the escapeway, the crew heard the order to evacuate the mine.

On the 0 Panel section, Shuttle Car Operator Scotty Nelson answered the call that instructed the crew to go to the intake escapeway telephone. Nelson informed Ray Kinder (Section Foreman) of the instructions. After arriving at the escapeway telephone, Kinder was further instructed to take air

readings. While Kinder was taking the air readings, the order was given to evacuate the mine. Kinder reported encountering dust in 3 East Mains between 10 Right and 5 Right. On the way out, Kinder was recruited by Chadwell and instructed his crew to continue out.

Eric Smith (Section Foreman) was on the 12 Right section when he was notified of the situation at 9:55 am. Approximately two minutes after being ordered to the intake escapeway, Smith and his crew were ordered to evacuate the mine. As they traveled, Smith rode in the front of the mantrip continuously taking air quality readings with his Solaris multi-gas detector. He did not detect any methane or carbon monoxide but did notice dust along 3 East Mains from 10 Right to 5 Right. When they met Chadwell at about 2 Right, Smith instructed his crew to continue out of the mine and he went with Chadwell.

When Green first began contacting personnel and sending them to the escapeways, Ruble and Clarkson obtained a mantrip and began traveling inby along 3 East Mains to determine the cause and extent of any damage. They first encountered dust at 5 Right and also reported that the regulator panels at 5 Right had fallen out. Gas tests at the regulator did not reveal any contaminants and the air was clear. Continuing on, they found a set of airlock doors at the mouth of 6 Right that were open and bent but the air was still clear. At this time, they proceeded on to the mouth of 9 Right and instructed Green to evacuate everyone. Ruble and Clarkson remained at the phone at the mouth of 9 Right to ensure that everyone had a ride out. Just after everyone had passed Clarkson and Ruble, Chadwell arrived with Smith, Kinder, Steele, and Begley. Clarkson took the four foremen and proceeded to the 8 Vent elevator.

When Meade arrived back at his office, he contacted Chadwell and Ruble who were still located at the mouth of 9 Right. Ruble informed Meade on what he and Clarkson had found. Meade sent Chadwell and Ruble to the mouth of 7 Right for further investigation. Meade also contacted Don Hylton (Seal Foreman) at the bottom of 8 Vent. Meade instructed Hylton to get with Clarkson and the two of them examine the mouths of each panel from 0 Panel toward Chadwell and Ruble at 7 Right.

Chadwell and Ruble reported from 7 Right that a stopping had been blown into the gob in the “dogleg” but air was still traveling in the proper direction. Meade then instructed them to examine 8 Right. After making their initial examination, Ruble reported to Meade that everything was good at the mouth of 8 Right and 27,000 cfm of clear intake was traveling up the tailgate entry as it should be. Next, Meade instructed them to travel the tailgate (#1) entry toward the longwall face. Chadwell and Ruble found everything clear and stoppings intact to crosscut 13. The stopping at 13 appeared to have been crushed, not blown, out. Taking advantage of the damaged stopping, Chadwell crossed over to the #2 entry for evaluation. He found the air to be clear. They continued up the #1 entry toward the

longwall face. They also found the stopping at crosscut 15 to be partially out. As they passed crosscut 16, Chadwell detected 10 ppm co. He took four more steps when he detected 25 ppm CO and they heard a roaring sound and felt a pressure change. They heard a rumbling as they turned outby to run and a pressure wave hit them in the back. The pressure knocked Ruble to his knees and Chadwell into a crib before falling to his knees. They donned their self rescuers and returned to the mouth encountering fresh air at crosscut 13. They returned to the phone at the mouth to report what they had seen and experienced. Once they informed management, they were told to come to the surface.

Clarkson and Hylton were also making examinations along 3 East Mains. They began at 0 Panel where they reported no damage and 0.0% CH₄, 41 ppm CO, and 20.8% O₂. Readings at 1 Right were 0.0% CH₄, 42 ppm CO, and 20.8% O₂ with no damage. Two Right also showed no damage with readings of 0.0% CH₄, 41 ppm CO, and 20.8% O₂. They also did not report any damage in 3 Right and the readings were 0.0% CH₄, 6 ppm CO, and 20.8% O₂. The readings at 4, 5, and 6 Right were all clear. There was one stopping blown out at 5 Right, a stopping blown out at 6 Right, and a set of airlock doors also was open at 6 Right. While at 6 Right, Clarkson and Hylton heard the mantrip with Chadwell and Ruble exiting the mine. All four men left and the mine was completely evacuated by approximately 12:20 pm.

MONITORING AND SEALING

Gas monitoring began immediately once the initial alarms were received and intensified after the mine was evacuated and more personnel became available. Carbon monoxide readings climbed to significant levels and continued to fluctuate at various locations in and around the 3 East gob. Nitrogen injection began on July 15, 2007 into various boreholes of concern in the 3 East gob. Nitrogen was also injected into Vent Shaft 6 to keep it inert due to its close proximity to a public highway.

Nitrogen injection and gas sampling continued until September 26, 2007 when injection was halted to evaluate the stability of the mine atmosphere. Nitrogen injection resumed on September 30 once the gas samples indicated carbon monoxide was still being produced.

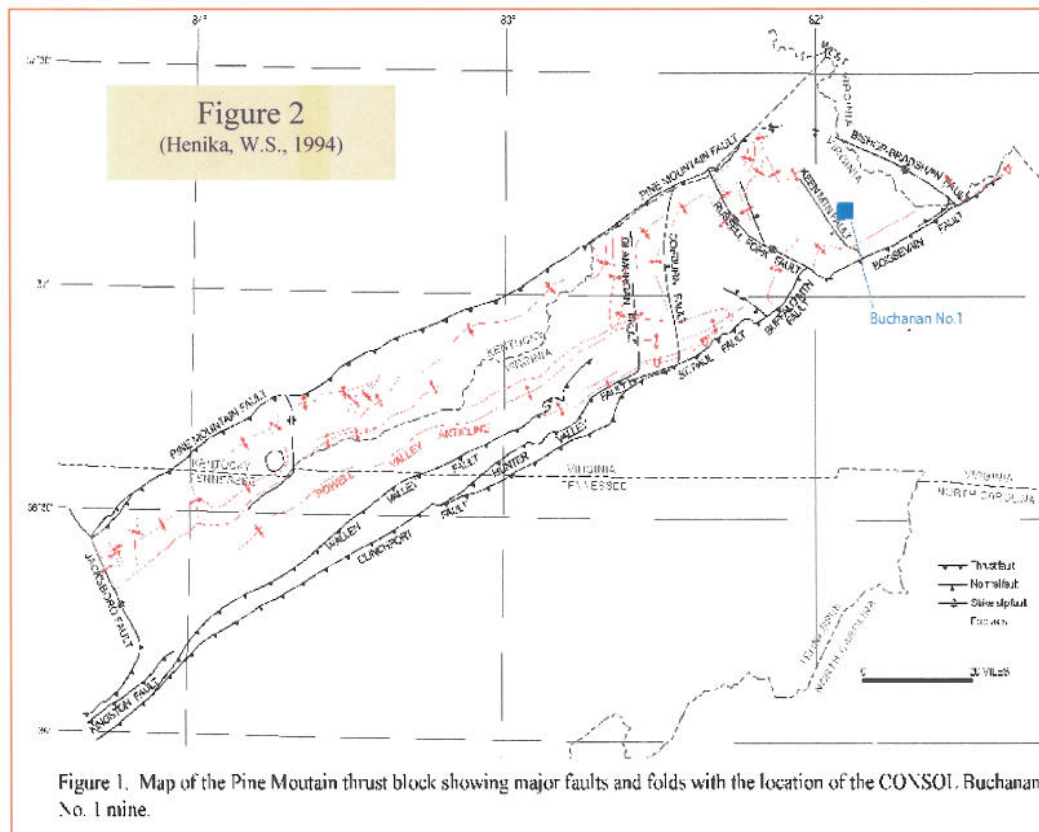
The mine was sealed November 27, 2007. The work was done by Consol Energy mine rescue teams and local construction contractors. The intake shafts, including the intake side of split shafts, were sealed with metal caps. The caps were lowered onto the shaft collars with cranes that were offset from the shafts. Return shafts and fan housings were sealed with inflatable bladders. The bladders in the shafts were lowered into position with cranes and then inflated. The bladders for the fan housings were carried into position by hand before being inflated. Once these bladders were inflated, their pressure was maintained using standard air compressors and very low pressure switches.

Monitoring continued at 39 locations in and around the 3 East gob and the mine remained sealed until January 20, 2008. By this time, oxygen levels had remained low enough to ensure combustion had ceased. The unsealing work was performed by Consol Energy's twelve mine rescue teams and local construction contractors. A copy of Consol's Unsealing and Re-entry plan is provided in Appendix C. After uncapping and restarting the mine fans, the main returns at the fans as well as the boreholes were sampled for the next eight days to determine when it would be safe for mine rescue teams to enter the mine.

Mine rescue teams were allowed to enter and explore the mine on January 29, 2008. The plan called for a rapid exploration of the 3 East Gob perimeter with all other areas of the mine being thoroughly examined once the gob area was declared safe. The teams worked twelve hour schedules and changed out at the work locations. Each team spent four hours surface back-up, four hours underground backing-up at and moving the fresh-air-base, and four hours exploration before returning to the surface for debriefing. Much of the work was done entirely on foot due to the track being blocked by deep water. Exploration was completed on January 31, 2008 without locating any problems. Ventilation was re-established for production on February 17, 2008.

GEOLOGY

The Buchanan No. 1 mine is located geologically within the northern portion of the Pine Mountain thrust block. Faults associated with movement of the Pine Mountain block generally strike northeast-southwest, paralleling the orientation of the block boundaries (Figure 2). The mapping in Buchanan No. 1 mine suggests that fault splays off of the main Pine Mountain thrust have risen up to multiple levels and continue as bedding plane faults. The Pine Mountain thrust in this area occurs in the



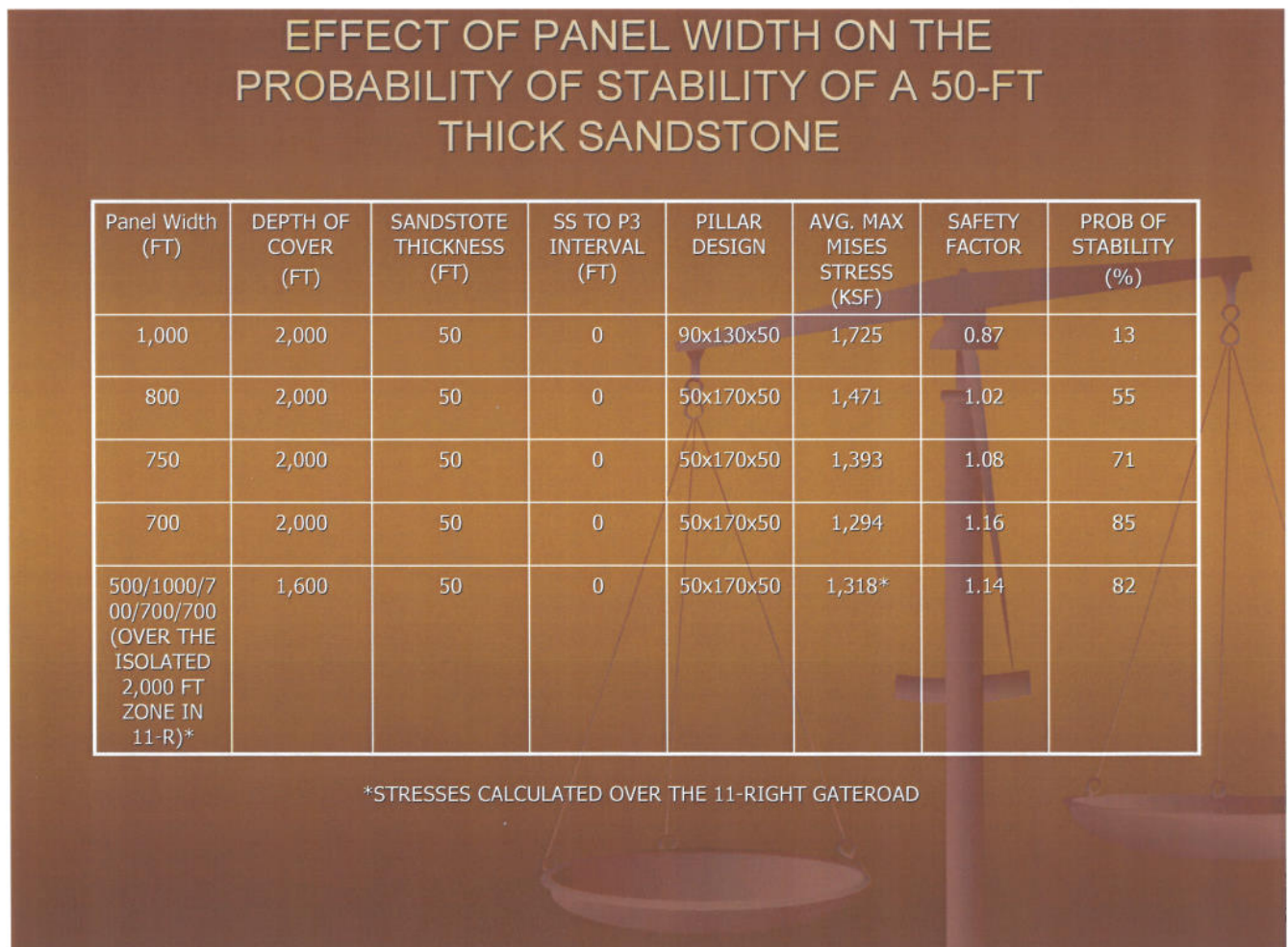
Chattanooga Shale and at a depth of approximately 3500 feet below sea level, or approximately 3,800 feet below mine level.

Geologic mapping along the 3 East Mains near 11 Right and 12 Right, which was the development face at the time, revealed numerous northeast-to-southwest oriented

faults (striking approximately N 45 E) with dips ranging from 30 to 60 degrees. Associated faults having the same trend, but dipping to the northwest, intersect the southeast dipping set to form blocks often termed “horsebacks” that were continuous across an entry and likely span several entries. As noted by the MSHA Tech Support personnel, these faults are associated with drag folds resulting from a bedding plane décollement (fault) separating the mine roof rock from the coal bed. There is also evidence that the coal bed is tectonically thickened in a portion of the mine, which indicates a décollement between the coal bed and the mine floor rock that broke up into the coal bed. These observations indicate that the northeast-southwest trends of the sandstone bodies shown on CONSOL geology mine maps are structurally controlled rather than depositional, a similar conclusion reached by MSHA Tech Support geologists.

More than a decade ago, a Bureau of Mines study was conducted to obtain a better understanding of the coal mine bump problem and its effect on underground coal mining in the eastern United States. To accomplish this, information was collected on the geologic conditions, mining techniques, and engineering parameters at five bump-prone mines. Two geologic conditions have been found to cause the occurrence of bumps in the eastern United States: (1) relatively thick overburden and (2) extremely rigid strata occurring immediately above and below the mine coalbed.

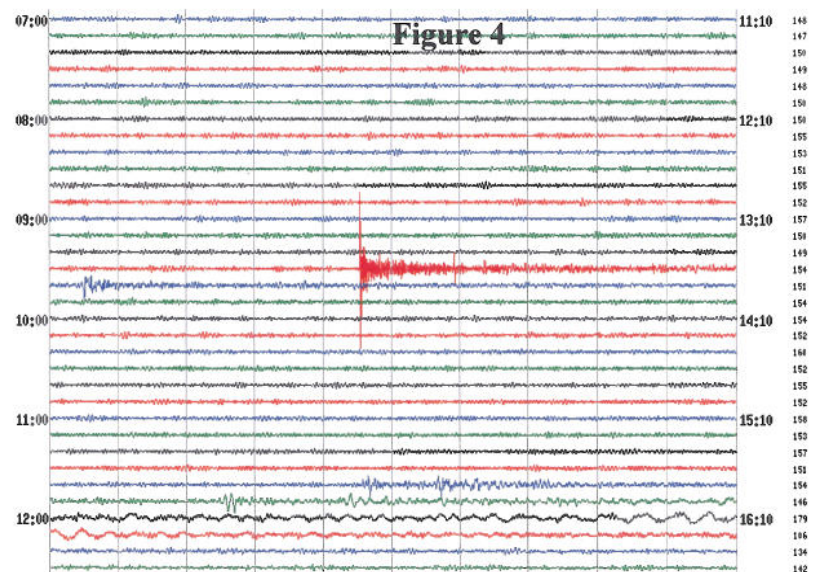
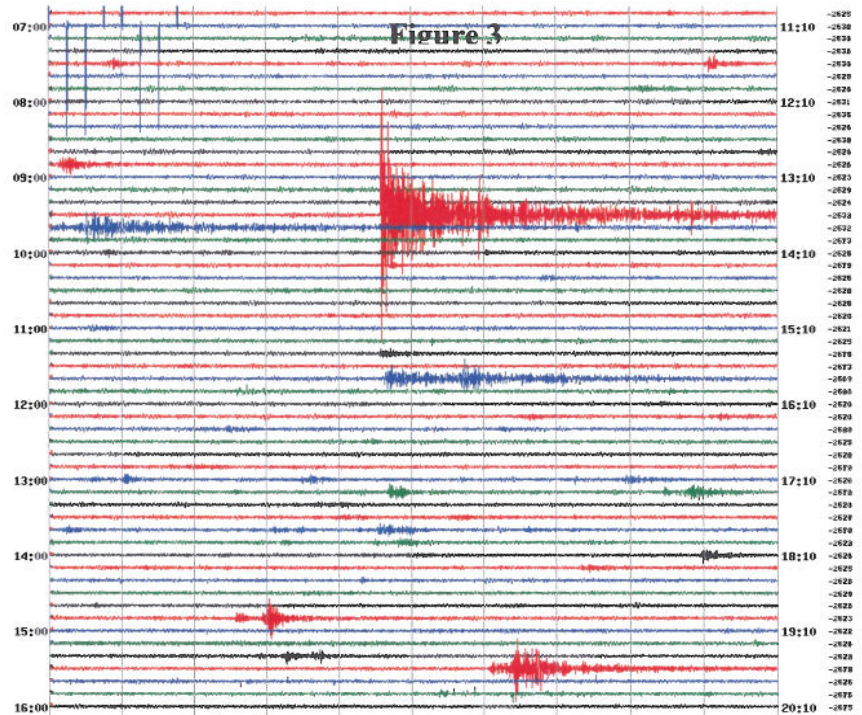
The roof in the Buchanan Mine is comprised of shale, sandstone, and sandy shale. There are two distinct sandstone layers present in the mine roof. They are commonly referred to as Sandstone 1 and Sandstone 2. Sandstone 1 lies just above the coal seam and sometimes is found to be in contact with the coal seam. Sandstone 2 is located above and is usually separated from Sandstone 1 by a shale parting. These sandstone layers have also been found to merge into one very rigid layer that may be from zero to seventy feet thick. The redesign of the mine's panel layout to 700 feet wide panels and modified pillar design will enhance stability and may eliminate future seismic events. A summary of five panel designs was provided by Dr. Su from Consol Energy. Their associated safety factors and probability of stability for 50' thick sandstone are shown in his chart below.



DISCUSSION

A failure in the massive sandstone layer overlying the 3 East Mains longwall gob area produced three very large geological energy releases. The effects described by miners during these events are defined in the Coal Mining Dictionary as “shock bumps”. However, in the region of Southwest Virginia, these “shock bumps” are commonly referred to simply as “bumps”. These bumps were recorded by Virginia Tech at approximately 9:43 am. The first registered 3.4 (figure 3) on the Richter scale and ninety seconds later the second registered as a 2.9 magnitude (figure 4). The roof failure initiated a series of events including ventilation interruptions, methane explosion(s) in the gob area, and a mine fire. A third event was recorded at approximately 10:32 pm after the mine had been evacuated and registered 3.4 on the Richter scale.

Frictional energy released by the roof fall is the most likely ignition source. This friction could either have been in the form of rock to rock contact or with roof bolts or plates installed in the mine roof. The rock to rock contact could have occurred anywhere in the gob area but contact with roof support could have only taken place in the gateroad areas since no supports are installed on the longwall face. The gateroad areas would seem a likely place for the ignition to occur. The compaction of interior gob areas prevents any significant airflow and



causes extremely high concentrations of methane and relatively little oxygen. Ventilation of the gateroads is greatly reduced due to significant convergence and subsidence. Any ventilation forced through the gob areas that does not travel around the perimeter would likely travel the gateroads. This reduced fresh-air flow mixing with the high methane levels of the interior gob could result in a flammable/explosive mixture.

Investigators were not able to evaluate the area where the explosion occurred due to the inaccessible nature of the gob. Consequently, investigators were not able to determine the extent of the flame. A limited amount of heat damage was found along the 9 Right Longwall face in the form of melted plastic items. A slight charring of wooden cap wedges was also found in the tailgate entry immediately outby the face.

ENFORCEMENT ACTION

The following enforcement action was taken as a result of the investigation:

1. An order of closure, No. TAR0008754, was issued under Section 45.1-161.91.A. (ii) of the Coal Mine Safety Laws of Virginia to control and preserve the scene pending an investigation. The order of closure was modified by approved procedural plans allowing necessary actions for recovery, sealing, reventilation, and exploration of the mine.

RECOMMENDATIONS

1. Longwall districts should be limited to a maximum of 4 panels in each district until new data and models support a greater number of panels.
2. Development of longwall panels should be limited to 700 foot faces until new data and models support wider panels.
3. Mine officials should discuss geologic data and mining plans with DMME inspectors and specialists prior to developing panels and selecting stopping points for the longwall.
4. Mine officials should continue to develop a seismic monitoring system to improve the safety of deep longwall mines.

CONCLUSION

At approximately 9:43 a.m. on July 9, 2007, an energy release caused an underground shock bump and roof fall in the 9 Right off 3 East Mains longwall gob area. Breaking of a thick sandstone layer just above the coal seam caused the energy release. The effects of the bump were seen and felt on the 9 Right longwall face and along 3 East Mains. The bump/roof fall likely initiated a methane gas ignition near the tail of the longwall. The air blast of the roof fall and expanding gases of the ignition caused an inundation of dust on the longwall face and 3 East trackway, brief air reversal on the longwall face, and CO alarms on the 3 East trackway. Due to these circumstances, management officials directed a mine wide evacuation. Following an extended period of monitoring, nitrogen injection, sealing, unsealing, and exploration by mine rescue teams, ventilation was reestablished and the longwall resumed production on March 15, 2008.

SIGNATURE SHEET

This report is hereby submitted by Chris Whitt and approved by Frank A. Linkous.

Chris Whitt

CHRIS WHITT, EMERGENCY RESPONSE COORDINATOR

10/23/08

DATE

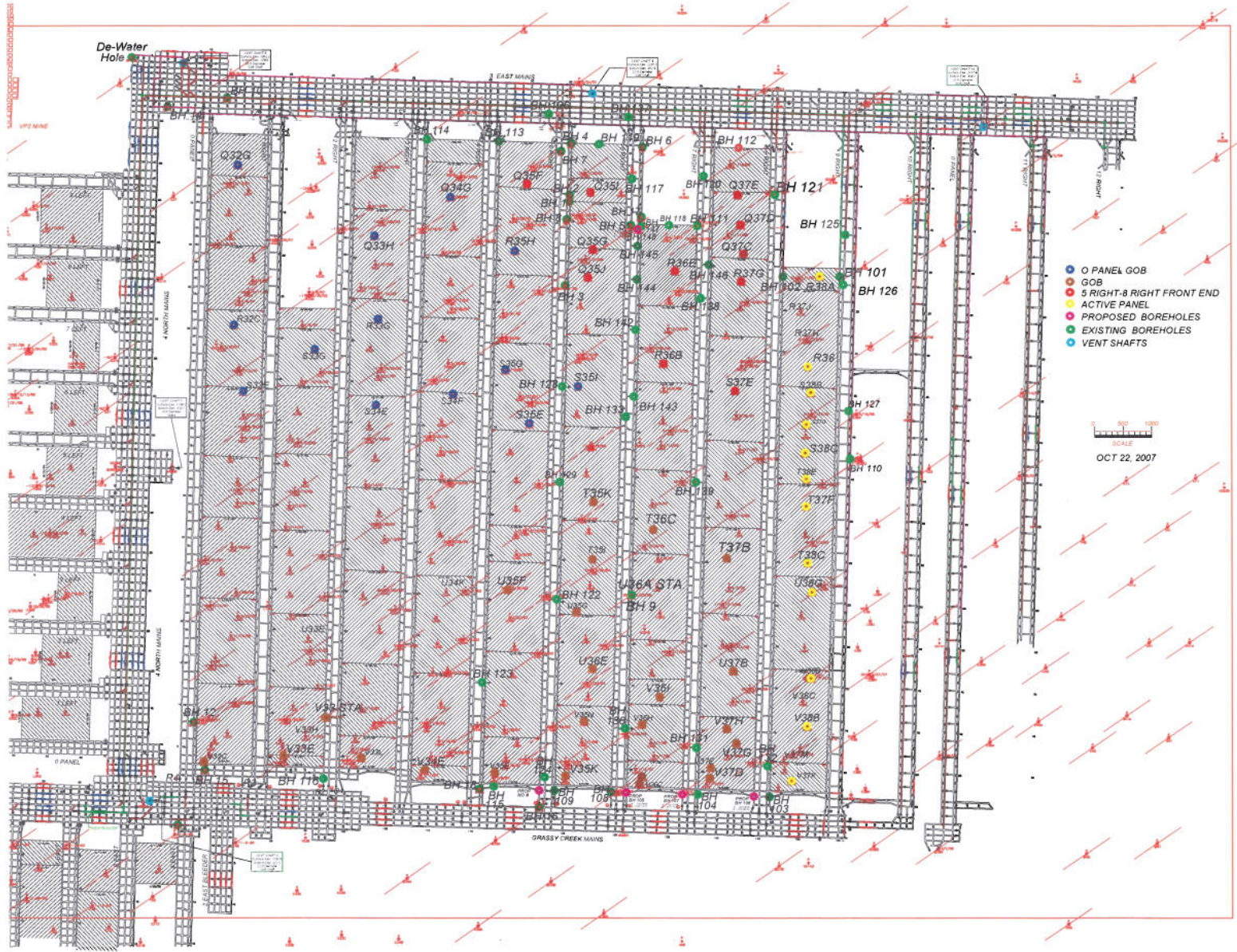
Frank A. Linkous

FRANK A. LINKOUS, CHIEF

10/23/08

DATE

Appendix A – Fire Area and Borehole Locations



Appendix B – Closure Order



COMMONWEALTH OF VIRGINIA
DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINES
PO DRAWER 900 • BIG STONE GAP, VIRGINIA 24219

0070737

ORDER OF CLOSURE - MODIFY

Company Name: CONSOLIDATION COAL COMPANY

Mine Name/Number: BUCHANAN MINE #1 Mine Index: 11912AA

VIOL/CO NUMBER: C-139802	ACTIVITY NUMBER: 0070737	ACTIVITY: 7/9/2007 11:48 AM	INSPECTION NUMBER: 67267
PERSON WITH OVERALL RESPONSIBILITY: KEN HARVEY		ACTIVITY TYPE: MODIFY	
SERVED TO: JOHN ZACHWIEJA		EXTENDED DUE DATE: 7/9/2007 12:30 PM	

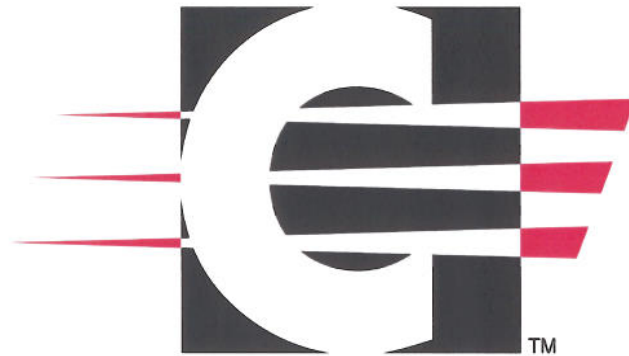
CONDITION/PRACTICE: Order of Closure No. TAR0008754 is modified to state that no mine personnel will be permitted underground following the evacuation of the four certified mine foremen who remained underground to investigate the initial incident subsequent to the evacuation of all other underground mine personnel. The order is also modified to permit the necessary monitoring of the underground mine atmosphere at the surface areas of the mine ventilation shafts and vertical degasification boreholes.

RATLIFF, TERRY A., INSPECTOR/SPECIALIST

Appendix C – DMME Agents Involved during Closure and Investigation

ALTIZER, DANNY W.	COAL MINE INSPECTOR
ASBURY, DAVID	EMERGENCY RESPONSE COORD.
BROWN, J. E., JR.	COAL MINE INSPECTOR
DAVIS, GARY C.	MINE TECHNICAL SPECIALIST
DAVIS, LARRY W.	MINE TECHNICAL SPECIALIST
ELSWICK, DAVID	MINE TECHNICAL SPECIALIST
GARRETT, ROBERT E.	MINE TECHNICAL SPECIALIST
GREEN, CARROLL R.	MINE INSPECTOR SUPERVISOR
LINKOUS, FRANK	CHIEF, DIVISION OF MINES
MARTIN, THOMAS	MINE TECHNICAL SPECIALIST
MATNEY, TONY	MINE TECHNICAL SPECIALIST
MCDAVID, JAMES DON	MINE TECHNICAL SPECIALIST
MCKINNEY, OPIE S.	MINE INSPECTOR SUPERVISOR
MESSICK, B. H.	COAL MINE INSPECTOR
MOORE, RANDY	COAL MINE INSPECTOR
PERKINS, DANIEL M.	MINE TECHNICAL SPECIALIST
RATLIFF, TERRY A.	COAL MINE INSPECTOR
RIFFE, DONALD J.	COAL MINE INSPECTOR
SIMPSON, ROBERT	MINE TECHNICAL SPECIALIST
SMITH, MATT E.	MINE TECHNICAL SPECIALIST
STURGILL, ANTHONY	MINE TECHNICAL SPECIALIST
TALBERT, JOHN	MINE TECHNICAL SPECIALIST
WARD, RUSTY	COAL MINE INSPECTOR
WILLIS, MICHAEL L.	MINE SAFETY ENGINEER

Appendix D – Consol’s Reentry Plan



Buchanan #1 Mine

**RE-VENTILATION AND MINE
EXAMINATION PLAN**

January 14, 2008

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- **Shaft Unsealing Procedures**

1. All work is to be done by trained mine rescue personnel, contractors and certified electricians. The initial Command Center will be in the large conference room at Oakwood.
2. Prior to uncapping (approximately 24 hours), the backup bladders at Vent Shafts 9, 8, 4, and 2 will be remotely deflated with a shop-VAC thru the service line and then removed outby the 300' Safety Zone.
The backup wall at Vent Shafts 4 and 2 will be dismantled and removed from the fan housing.
3. Depending on the need at each respective shaft, a crane and/or boom truck will be moved to all shafts.
4. Diesel auxiliary fans will be available to all sites.
5. The following work will be done prior to uncapping:
 - a. At the Production Shaft, Page Service Shaft and Vent Shaft 8 (Intake side) the line curtain, rock dust and rubber matting will be removed.
 - b. The back-up bladders at Vent Shafts 9 and 8 will be remotely deflated with a shop VAC thru the service line and removed from the shaft.
 - c. The return and intake sample lines along with the return side nitrogen fire hose line will be removed from the shafts. A sample line will be hooked up on the return side of the fan housing.
6. After the return shaft bladder and the intake cap have been removed, the boom truck, crane, and auxiliary fan(s) will be de-energized. All persons will then be removed outby the 300' Safety Zone.
7. All Vent Shafts will be unsealed simultaneously.
8. Power will be established to the surface sites in the following order;
10 and 9 vent fan power simultaneously
8 vent power
6 vent power
4 vent power
2 vent power
9. Fan Starting Sequence:
 - a. Degas pumps will be started
 - b. Vent Shafts 10 and 9 fans will be started first.
 - c. After Vent Shafts 10 and 9 fans have ramped up, Vent Shaft 8 fan will be started.
 - d. After Vent Shaft 8 fan has ramped up, Vent Shaft 6 fan will be started.
 - e. After Vent Shaft 6 fan has ramped up, Vent Shaft 4 fan will be started.
 - f. After Vent Shaft 4 fan has ramped up, Vent Shaft 2 fan will be started.
10. After all fans have been re-started and have gone through the explosive range, the electric pump at de-
Watering hole 135 will be re-started.

Details on the deep well pump at VS 8. Water levels, air pumps, etc.

The deep well pump is located in #1 entry of 4 norths, inby break 100. The borehole was cased through the seam with slots in the pipe approx. 3 feet above the mine floor to allow water to the pump. The pump inlet is approx. 20 feet below the seam and the motor is below the pump inlet. The motor controls include an undercurrent shut off so that if there is not enough water to pump, the pump is shut off.

- **Communications**

COMMAND CENTER

A command center is set up in the large conference room at Oakwood.

1. Oakwood Office:

- Mine map 1"= 500' on wall showing all shafts and monitoring boreholes
- Two phone lines 498-8228 and 498-8271
- Gas Chromatographs and operators
- Two company officials
- DMME representative(s)
- MSHA representative(s)

2. Shafts:

One company representative will be manning a phone at each of the following locations.

- Service Shaft 498-3301 (One person covers Vent Shaft 1 and the Production shaft.)
- Vent Shaft 2 498-3298
- Vent Shaft 4 498-3808
- Vent Shaft 6 498-7678
- Vent Shaft 7 498-3584
- Vent Shaft 8 498-3594
- Vent Shaft 9 498-4269
- Vent Shaft 10 881-8369

Total people required: 8

3. Re-Ventilation Sampling

<u>Front End</u>	<u>Back End</u>	<u>Interior</u>	<u>Vent Shafts</u>
6	12	R38	VS2
7	15	1	VS4
101	16	3	VS6
102	103	123	VS8
111	104	129	VS9
113	108	138	VS10
114	109	139	

117	115	143
118	116	144
119	124	145
120		
121		
125		
126		
127		

Note: Sampling on Vent. Shafts will be on the return side only.

4. Mine Exploration Sampling

In addition to the above required samples, the following locations will be continuously monitored using hand held instruments or other devices when mine rescue persons are underground:

Boreholes 6, 7, 12, 15, 101, 103, 104, 111, 113, 115, 120, 121, 124, 138, and 144.

Return shafts 2, 4, 6, 8, 9, and 10.

A log will be kept at each location and the readings recorded every 10 minutes. Upward trends in CO readings will be reported to the command center at the Contrary Portal.

- **Contrary and Page Portal Command Centers**

1. A Field Station will be established at:
 - a. Vent Shaft #8 (Primary point of entry)
 - Map 1" = 500 feet
 - Two Phones 498-6915; 498-****
2. The Command Center will remain at Oakwood until such time the mine is ventilated then the Command Center will be moved to Contrary Portal when approved.
3. A communication center will be established at the Page Portal to report the examination of the Page Portal mine rescue teams to the Contrary Command Center.

- **SAMPLING**

SAMPLE SITE PREPARATION

All sampling lines will be 3/8" o.d. black hard plastic sampling line.

SAMPLE PROCEDURES AND ASSIGNMENTS

A hand held-reading and a syringe sample will be taken at each location at the times shown below. After each site is sampled, the results of the hand-held readings will be communicated to the command center.

RUNNER A	RUNNER A	RUNNER B	RUNNER B	RUNNER C
SAMPLE TIMES	SAMPLE TIMES	SAMPLE TIMES	SAMPLE TIMES	SAMPLE TIMES

7:00 AM / PM	9:00 AM / PM	7:00 AM / PM	9:00 AM / PM	8:00 AM / PM
11:00 AM / PM	1:00 AM / PM	11:00 AM / PM	1:00 AM / PM	12:00 AM / PM
3:00 AM / PM	5:00 AM / PM	3:00 AM / PM	5:00 AM / PM	4:00 AM / PM
SAMPLE LOCATIONS	SAMPLE LOCATIONS	SAMPLE LOCATIONS	SAMPLE LOCATIONS	SAMPLE LOCATIONS
VS 8	BH 115	BH 143	VS 10	R 38
BH 113	BH 109	BH 129	BH 1	BH 127
BH 114	BH 108	BH 123	BH 117	VS 4
VS 9	BH 104	BH 139	BH 7	VS 2
BH 3	BH 116	BH 144	BH 119	BH 103
BH 145	BH 15		BH 6	
BH 118	VS 6		BH 121	
BH 111	BH 12		BH 125	
BH 138	BH 16		BH 126	
	BH 124		BH 102	
			BH 101	
			BH 120	

RETURN SHAFTS

1. 10-Vent will be sampled thru a port located in the fan housing. The sampling line will then be run to the sampling location already set-up at 10-Vent. Power source will be by generator in place. Communication will be by telephone.
2. 9-Vent will be sampled thru a port located in the fan housing. The sampling line will then be run to the sampling location already set-up at 9-Vent. Power source will be by generator in place. Communication will be by telephone.
3. 8-Vent will be sampled thru a port located in the fan housing. The sampling line will then be run to the sampling location already set-up at 8-Vent. Power source will be by generator in place. Communication will be by telephone.
4. 6-Vent will be sampled thru a port located in the fan housing. The sampling line will then be run to the sampling location already set-up at 6-Vent. Power source will be by generator in place. Communication will be by telephone.
5. 4-Vent will be sampled thru a port located in the fan housing. The sampling line will then be run to the sampling location already set-up at 4-Vent. Power source will be by generator in place. Communication will be by telephone.
6. 2-Vent will be sampled thru a port located in the fan housing. The sampling line will then be run to the sampling location already set-up at 2-Vent. Power source will be by generator in place. Communication will be by telephone.

- **Contractors**

The following Contractors will be used when needed during re-entry to the mine, maintenance of seals, equipment operators, etc. All Contractors will be briefed with the applicable plan that has been approved by MSHA and DMME, prior to starting a job or task. Additional specialty contractors may be used based on qualification

<p><i>Coalfield Services</i> <i>Scott Aker: office 276/228-2747</i> <i>home 276/228-7216</i> <i>cell 276/620-0579</i> <i>Vince Powers: home 276/322-1407</i> <i>Cleco Corp. Jeff Harman office 276/880-1034</i> <i>home 276/988-3049</i></p>	<p><i>K & K Const. Howard Cook hm./off. 935-6293</i> <i>Excell Well Services Kenny Hale home 498-1186</i> <i>Pager 888/456-037</i> <i>Matney Const. Chester Rowe office 935-6195</i> <i>shop 935-1796</i> <i>home 498-4273</i></p>
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- **Mine Rescue Teams**

A check in/out system will be implemented at all sites during fan preparation and site preparation through the Command Center or at the site outside the 300 foot safety zone.

<u>Blacksville #2</u>	<u>Bailey</u>
Doug Wade (C)	Dennis Vicinelly (C)
Kevin Bee	Dave Cass
John Burnett	Steve Edgehouse
Tony Casini	George Joseph
John Clawges	Mike Spears
Lonny Myers	Kevin Williamson
Jim Ponceroff	Jon Renner
Douglas Stainaker	Matt Crowson

<u>Buchanan Blue Team</u>	<u>Buchanan Orange Team</u>
Scott Honaker (C)	Dennis Perry (C)
Keith Richardson	John Teets
Kenny Richardson	Sakshi Ganesh
Tim Bandy	Christopher Whitt
David Goad	Andy Sawyers
Matthew Lane	Glen Thompson
Ryan Johnson	Eddie Wine
Mike Moten	Johnie Brown

<u>Consol of Kentucky</u>	<u>Enlow Fork</u>
James Kelly (C)	Shawn DeWitt (C)
Joey Sammons	George Maxwell
Denny Combs	Doug Shaffer
Brandon Wilde (Emery)	Bill Whipkey
Josh Fuller	Brandon Dorsey
Donnie Polly	Robert Revi
Alan Webb	Kevin Williams, Jr.
Jack Hudnall	Todd DeWitt

<u>Loveridge</u>	<u>McElroy</u>
Richard Shockley (C)	James Smith (C)
Robert Hovater	Randy Clark
Leslie Cosner	Mike Clark
Pat Layman	Kelvin Jolly
Richard Crowder	Mark Meager
Nelson Gemondo	Brandon Otto
Gary Hayhurst	Michael McVay
Gary Hayhurst, Jr.	Todd Hixon

<u>Mine 84</u>	<u>Robinson Run</u>
Donald Krek (C)	Mark Koon (C)
Rich Gindlesperger	William Reid
Adrian Gordon	Dave Bell
John Stowniski	Craig Carpenter
Mike Reese	Derek Bragg
Jason Burchick	Larry Tenny
Steve Appleton	Don Jack
Bernie Geisel	Corey Prettyman

<u>Shoemaker</u>	<u>Buchanan Gold</u>
Cliff Ward (C)	Danny Quesenberry (C)
Bob Haines	Mac Ruble
Okey Rine	Reggie Lambright
Glen McWhorter	Jackie Horn
Charles Fisher	Randy Cox
Jim Tooley	Josh Honaker
Nate Hercules	Eric Hayhurst
Peter Behling	Ronnie Bloomer (Emery)

- **Unsealing Safety Precautions**

1. Prior to beginning work, the worksite will be examined by trained mine rescue personnel wearing apparatus and designated by the operator to make such examinations. At vent shafts 10, 9 and any other outgassing shafts persons entering the collar area and fan housing shall wear an apparatus. Designated apparatus use areas will be determined at this time by the examiner and cordoned off.
2. All work performed at the worksite shall be under the direct supervision of a responsible person. The responsible person shall have access to direct communication with the command center at the Oakwood office, while persons are within the established 300 foot safety zone.
3. Access to the work site will be guarded.
4. Any person working next to the shaft shall have access to a self-contained breathing apparatus. While work is being performed, the atmosphere in and around the shaft will be continuously monitored by designated mine rescue personnel.
 - a. Gas levels when performing work bare faced: $\text{CH}_4 < 4.5\%$; $\text{O}_2 > 19.5\%$; $\text{CO} < 50 \text{ ppm}$
 - b. Gas levels at internal combustion engines located within the 300 foot safety zone: $\text{CH}_4 < 2.0\%$; $\text{O}_2 > 19.5$
5. No smoking and/or smoking articles will be permitted inside the 300 foot safety zone.
6. Fire fighting equipment consisting of 4 – 20 lb fire extinguishers or a readily available fire hose will be maintained at the job sites.
7. All persons working in close proximity to the shaft where fall protection is not provided or a fall potential exists shall wear a safety harness and a lanyard attached to a suitable structure.
8. Upon completion of start-up tasks where a crane, boom truck, or auxiliary fan are used to position/remove/install metal caps or open explosion doors to facilitate fan start-up, the boom truck or crane will be de-energized or moved outside the 300 foot safety zone. The boom truck or crane will be equipped with a SCSR and operators will be trained in their use.
9. During fan start-up only those person necessary to monitor the atmosphere and operate the crane or boom truck will be permitted within the 300 foot safety zone and upon completion will promptly proceed outside the 300 foot safety zone.
10. During the re-ventilation process for re-entry where the fan discharge is within the 5 to 15% explosive range, only those persons necessary to monitor or make periodic inspections will be permitted to approach the sites and then only through approval of the Command Center. The Command Center can impose a greater distance restriction of the safety zone when necessary.
11. Remote start-up circuits for fans will be tested prior to unsealing.

- Mine Fan Preparation Plan for Start-up

Safety Precautions

1. Prior to beginning work, the worksite will be examined by trained mine rescue wearing apparatus personnel designated by the operator to make such examinations, prior to persons, other than the examiner, entering the 300 foot safety zone. Vent shafts 10, 9 and any other outgassing shafts will be designated apparatus use areas will be determined at this time by the examiner.
2. All work performed at the worksite shall be under the direct supervision of trained mine rescue personnel. The mine rescue personnel shall have access to direct communication with the command center at the Oakwood office, while persons are within the established 300 foot safety zone.
3. Access to the work site will be guarded.
4. Any person working next to the shaft shall have access to a self-contained breathing apparatus. While work is being performed, the atmosphere in and around the shaft will be continuously monitored by designated mine rescue personnel.
 - a. Gas levels when performing work bare faced: CH₄ <4.5%; O₂ >19.5%; CO <50 ppm
 - b. Gas levels at internal combustion engines located within the 300 foot safety zone: CH₄ <2.0%; O₂ >19.5
5. No smoking and/or smoking articles will be permitted inside the 300 foot safety zone.
6. Fire fighting equipment consisting of 4 – 20 lb fire extinguishers or a readily available fire hose will be maintained at the job sites.
7. All persons working in close proximity to the shaft where fall protection is not provided or a fall potential exists shall wear a safety harness and a lanyard attached to a suitable structure.

Procedures:

1. The lubrication unit, where provided, along with the fan house will be pressurized with tubing attached to a blowing fan located outside the 300 foot safety zone.
2. During site preparation work, a portable blower fan will be used to direct an air current toward the intake shaft to reduce the potential for accumulation of explosive or noxious gases in the work area.
3. Examine all electrical boxes and conduits for methane.
4. Preliminary work will be required at the sites to prepare for fan start up which is as follows:
 - a. A remote means will be provided to:
 - i. Start the fan from outside the three hundred (300) foot safety zone.
 - ii. Monitor the fan water gauge and amperage from outside the three hundred (300) foot safety zone.
5. A boom truck and or a crane will be positioned at all the return shafts to open the explosion doors in the event the fan stalls when started. During this operation, mine rescue personnel will continuously monitor the atmosphere at the boom truck and/or the crane for methane. Should the methane level at the boom truck and/or crane reach 2%, the equipment will be shut down.

- The attachment to the spreader lines shall be made via cloth or non-metallic lifting straps. This attachment shall be made in such a manner that no person is positioned above the shaft opening when installing or removing the connection.
 - All persons handling tag lines or directing the work will wear mine rescue breathing apparatus.
 - To assure air quality, a blowing fan(s) will be used:
 - i. To direct air across the crane and/or boom truck
 - ii. Pressurize fan house and lube unit where used.
6. A responsible effort will be made to notify residents located within a half-mile radius of each return fan of our intentions to restart each respective fan.

- **Commissioning Elevators**

General Plan

Safety Precautions

- Prior to beginning work, the worksite shall be examined by trained mine rescue personnel designated by the operator to make such examinations, prior to persons, other than the examiner, entering the 300 foot safety zone.
- All work performed at the worksite shall be under the direct supervision of a responsible person. The responsible person shall have access to direct communication with the command center at the Oakwood office, while persons are within the established 300 foot safety zone.
- While work is being performed the atmosphere in and around the shaft shall be continuously monitored for levels of methane and carbon monoxide. Any person working next to the shaft monitoring gases shall have access to a self contained breathing apparatus.
- No smoking and or smoking articles will be permitted inside the 300 foot safety zone.
- All persons working in close proximity to the shaft shall be tied off.
- Fire fighting equipment consisting of 4 – 20lb fire extinguishers or a readily available fire hose will be maintained at the job site.
- The elevator will be cycled one time before personnel are lowered into the mine. The second trip will be made by a mine rescue person under apparatus to examine the hoist and shaft.
- During the inspection phase of the elevator and shaft infrastructure, the atmosphere of the shaft will be monitored for: Carbon Monoxide, Oxygen and Methane as the cage is lowered to the coal seam level.
- At all times while the elevator is in service and mine rescue personnel are underground, a hoisting engineer will remain in the hoist room and have the capability of operating the elevator from this location. Until such time as the elevator is returned to normal automatic operation, a hoisting engineer will be stationed in the hoist room. The elevator must remain in the manual mode until all switches, circuits and other safety devices are restored, and the elevator is returned to normal automatic operation.
- Prior to starting the job all persons involved with site preparation work will be briefed in the aforementioned procedures.
- Qualified and certified persons to commission elevators and escape hoists:
 - i. Sam Beavers
 - ii. Keith Meade

- iii. Darrell Blackwell
 - iv. Curt Salyers
 - v. Scott Bowman
 - vi. Eddie Breeding
 - vii. Elmer Deel
 - viii. Randy Ratliff
- *** Travel time for escape capsule is 7 minutes one way

The following list describes the work that will be performed to the elevator. Note items 1 thru 5 are not sequential.

1. Inspect and lubricate the machine room equipment.
2. Disable all unnecessary functions or appliances not needed for manual operation of the elevator. (Lights, heaters etc.)
3. Remove the automatic operation feature so the cage can only be operated at the controller.
4. Establish and confirm communication from the cage to the hoist room. Also, establish a second means of communication from the cage to the hoist room. Two-way radio communication may be used.
5. Inspect cage.

Items 6-10 listed below will be addressed after the initial mine ventilation is completed, and the Command Center has evaluated the ventilation of the mine. Note items 6 thru 10 are not sequential.

6. Restore power and operate cage from the hoist room, testing the hoist controls.
7. Inspect all elevator components at the area where the temporary seal had been removed. Inspection may be done from the top of elevator.
8. The cage will be cycled one time before personnel are transported and an inspection of the shaft and appurtenances will then be conducted.
9. Upon completion of the examination of the hoist equipment work may continue by qualified person to bring the elevator back to normal automatic operation. However, no work will be initiated which would result in the elevator not being readily available to transport Mine Rescue personnel in or out of the mine.
10. The elevator capacity will be limited to mine rescue personnel until such time as a fresh air base is set up at the shaft approaches at the coal seam level and hard wire communications are established with the surface.

- **Re-Entry from Vent Shaft #8**

FRESH AIR BASE

Definition: After an area has been examined, phone lines inby that location will be disconnected, phone communication to command center established and afterwards, man trips will be moved to that location. Supplies and back-up teams will be moved to this location as well.

EXAMINATION:

Examination of each area includes: air quality, quantity and direction of air flow, if requested. In addition, condition of ventilation controls and any abnormal conditions will be immediately communicated to the command center. If air quality readings exceed the following levels they are to be communicated to the command center:

- Methane – +1.00%
- CO - 5 PPM
- Oxygen - Less than 19.5%

Work made be done bare faced, when the air quality is less than 50 PPM and the oxygen level is greater than 19.5%.

Methane examinations shall be conducted in high top areas along the track entries prior to diesel equipment being operated in the area.

ADJUSTMENTS

Changes to the examination sequence or area sequence, that are needed, will be made by the command center as the examinations are conducted.

- **Underground Mine Examination**

Ventilation Shaft #8 elevator will be commissioned and the shaft examined by qualified persons, additionally, the escape hoists at Vent Shaft #9 and #10 will be examined and test run for operational integrity. All examinations will be conducted with permission from the Command Center. Once the mine has been ventilated, the Command Center will be moved to the Contrary Portal. The following designated areas will be assigned:

Command Center – will be located in the little conference room upstairs

Mine Rescue Team Briefing and Debriefing Area – Training room upstairs

Security – Will be located in the security office

The established check-in / check-out system will be utilized to account for all persons entering and leaving the mine. The Command Center will keep track of the mine rescue team(s) movement along with any agency personnel with them.

Until the entire mine has been explored, all supplies will be moved by trained mine rescue personnel.

Establishing a Fresh Air Base:

The initial fresh air base will be established at the bottom of Contrary Portal (Vent Shaft 8). Air quality exams will be made in this area and reported back to the Command Center. As examinations progress, air quality checks will be conducted for methane, oxygen, carbon monoxide and condition of ventilation controls will be reported back to the Command Center.

Upon exploration of Area 1A (see map), diesel man trips will be examined and used to transport mine rescue team members, MSHA and DMME personnel to the next established fresh-air base under the guidance of the Command Center.

Once the fresh-air base has been established, the compressed air line will be isolated between the horizontal degas and air pumps. The air pumps will be started at this time.

Examination:

Phone lines in by the examination team will be disconnected and phone communication established to the Command Center after each examination sequence.

Selected fans and boreholes will be monitored for any significant changes. The location and changes will be communicated to the Command Center and to the underground teams.

Examination of each area includes: air quality, direction of air flow, condition of ventilation controls and air quantity, if requested. In addition, condition of ventilation controls and any abnormal conditions will be immediately communicated to the Command Center.

Adjustments:

Changes to the examination sequence or area sequence that are needed, will be made by the Command Center as the examinations are conducted.

Examination Sequence:

Examinations will be conducted in the # 7 & # 8 entries of 3 East Mains, panel by panel up to 9 Right. Two or more mine rescue personnel will be assigned to the # 7 & # 8 entries. The condition of the return stopping line between the # 6 & # 7 entries will be examined as they advance. At the mouth of each panel, mine rescue personnel shall examine inby to the separation stoppings. The # 1 & # 2 entries of 3 East Mains will be examined at the mouth of each panel.

Once these exams are conducted, the communication line inby the track entry of each panel will be cut. The phone line will be advanced by the backup team and communications established with the Command Center prior to examinations continuing.

After communications are established at the mouth of 9 Right, a mine rescue team and a back-up team will examine the # 1 entry of 8 Right up to and across the face of the active longwall and travel down the track entry and meet up with the mine rescue teams examining the 9 Right side of the active longwall. During the examination of 9 Right, the mine rescue team will examine all four entries from the mouth to the longwall face. At breaks 6 and 16 in all 4 entries air quantity measurements shall be conducted. Once these exams are conducted at each of these break locations, the communication line inby will be cut. The phone line will be advanced by the backup team and communications established with the Command Center prior to examinations continuing.

Examinations will continue up 3 East Mains by two mine rescue teams to the mouth of 10 Right and the communication advanced and established to the Command Center.

After the communication is established at 10 Right, one mine rescue team and a back-up team will examine all four entries from the mouth of 10 Right to the longwall setup face. At breaks 6, 42 and 82 in all 4 entries air quantity measurements shall be conducted. As the teams advance up 10 Right, the phone line will be advanced by the backup team and communications established with the Command Center as examinations progress. The examination of 10 Right shall include the set up face and all ventilation controls on both the head and tail side of the set up face.

While one team and a back-up is examining 10-Right, one team and a back-up will examine the # 1 heading in 9-Right to the 10-Right set-up face. These teams will also check in the # 2 entry where accessible.

After this phase is complete, one team and a back-up team will withdraw and travel back to Contrary bottom to begin examination from the top of 4-North Mains to 6 Vent.

One team and a back-up team will remain at the back end of 9-Right Panel to begin examining the back-end of panels, down Grassy Mains Bleeders.

Two team members will remain at the top of 10-Right Panel to maintain communications with the Grassy Bleeder Teams and the Command Center. These two team members will also bring the man trips back to Contrary bottom after bleeder examination is completed.

When the teams from 4-North examine to 6-Vent, they will enter the lower end of Grassy Bleeder, tying in the 6-Vent area. They will then start examining the back side of the mouth of O-Panel, 1-Left, 2 Left and the entries driven south.

The team will then meet up with the teams that have been examining the back side of 9-Right, 8-Right, 7-Right, 6-Right, 5-Right, 4-Right and 3-Right. The teams will meet near 100 Block in Grassy Mains completing the perimeter.

PHASE II

After the entire perimeter has been examined, the second wave of Mine Rescue Teams will enter the mine from both the Contrary and Page portals. The elevator in the Service Shaft at Page portal will be commissioned and the shaft examined by qualified persons. The Page portal teams will communicate their examinations outside to the Page portal who will report to the Command Center at Contrary.

Two teams will enter at the Contrary portal and one team will remain outside as back-up. One team and a back-up will proceed just inby the start of area 7. The teams will examine O-panel, 11-Right, 12-Right and 3-East Mains, to the farthest point of development. These areas will be examined for air quality, quantity and air flow direction and the condition of major ventilation controls.

At the same time the examination is being conducted, two teams will enter the Page area of the mine via the Page portal shaft. One team will remain outside as the back-up team. The bottom area will be examined and diesel rides commissioned to transport teams. The teams will begin examining area 8 working toward the Grassy Mains area.

The teams that completed the 3 East Mains area will then be transported to the top of Grassy Mains to start the examination of area 9.

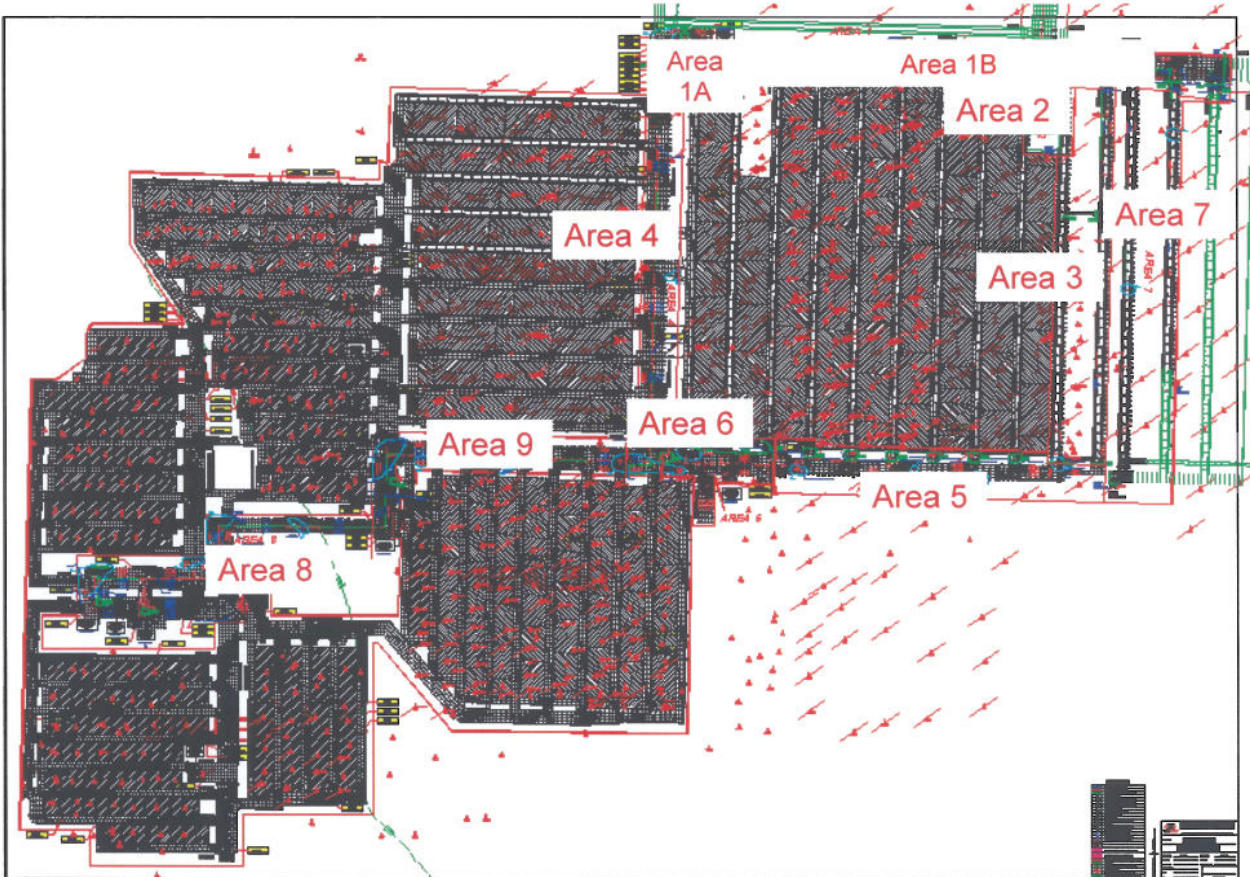
These teams will examine west in area 9, toward the teams in area 8.

All teams will be briefed on the areas they will be examining. The teams will be provided with area maps, showing ventilation, any possible accumulations of water, any known roof falls, air airlocks that may be difficult to access and particular areas to examine closely.

In addition, all teams will be briefed by Buchanan Mine Managers that will review in detail the areas they will be traveling.

A 400 foot to the inch master map will be posted at the Command Center with exploration zones identified. Zone maps will be 200 feet to the inch on 11" by 17" sheets, consistent with Mine Rescue Team Map Boards. As exploration continues and the exploration of a zone is completed, the Command Center map will be copied and distributed to both agencies along with a copy to the Mine Engineer to transpose onto an electronic map of the mine. Underground exploration maps will be copied and delivered to the Agencies, the Command Center and the Mine Engineer after debriefing of the Mine Rescue Team.

Areas 7, 8, and 9 will basically be spot checked, unless conditions deem otherwise.



- **Rehabilitation**

After examination of the mine, any necessary ventilation repairs will be conducted by mine rescue personnel. After damaged ventilation controls are restored, a monitoring period will be established prior to non-mine rescue personnel entering the mine.

Re-establish 8-hour intervals of Pre-Shift Examinations

Conduct Weekly Examinations

Examine all Electrical installations:

- Surface-
 - Power centers, switch gears, conduits and buildings installed within 300 feet of any shaft will be examined for accumulations of methane
 - Power Contrary and Page Service Hoists
- Underground high voltage
 - Underground power will be established at the following locations:
 - 8 underground feed
 - 9 underground feed
 - 6 underground feed
 - 10 underground feed
 - 1 borehole feed

Sequence will begin at each Service Shaft and proceed towards the other power feeds.

WORK TO BE DONE TO POWER UP UNDERGROUND HIGH VOLTAGE AT VENT
SHAFT # 8

- Ventilate mid-shaft junction box.
- Ventilate junction box at mine level.
- Ventilate fiber optic junction box
- Ventilate sump pump control box.
- Ventilate high voltage control box.
- Remove covers on VCB on bottom, ventilate and check for methane.
- Unplug input cable.
- Clean and megger VCB.
- Unplug output cables.
- Clean and megger outputs of VCB.
- Remove covers from 8 Vent bottom power center, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger 8 Vent bottom power center.
- Check for methane, replace covers, input cable, and feed through cable.
- Energize from surface to 8 Vent bottom.
- Remove covers on 3 East #2 belt power center, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger belt power center.
- Disconnect all couplers from VCB to 3 East #2 belt power center.

- Clean and megger all couplers and cables.
- Check for methane, replace covers and couplers.
- Remove covers on sizer power center, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger sizer power center.
- Clean and megger feed through cables and couplers.
- Remove covers from 3 East #3 belt power center, ventilate and check for methane.
- Unplug input feed through and output cables.
- Clean and megger 3 East #3 belt power center.
- Remove covers from 10 Right VCB, ventilate and check for methane.
- Remove covers from 10 Right belt power center, ventilate and check for methane.
- Unplug input feed through and output cables.
- Clean and megger 10 Right VCB.
- Clean and megger 10 Right belt power center.
- Disconnect all couplers from 10 Right VCB to 8 Vent VCB
- Clean and megger all couplers.
- Check for methane, replace covers, install input cable, and reconnect couplers from 10 Right VCB to 8 Vent VCB.
- Energize from 8 Vent VCB to 10 Right VCB.
- Remove covers from 10 Right section power center, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger 10 Right section power center.
- Remove covers from 10 Right booster power center, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger 10 Right booster power center
- Disconnect all couplers from 10 Right booster power center to 10 Right VCB.
- Clean and megger all couplers.
- Check for methane, replace covers, install input and feed through cables, and reconnect couplers from 10 Right booster power center to 10 Right VCB.
- Energize from 10 Right VCB to 10 Right section power center.
- Remove covers from 0 Panel section power center, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger 0 Panel section power center.
- Remove covers from 0 Panel degas power center break 70, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger 0 Panel degas power center break 70
- Disconnect all couplers from 0 Panel degas power center break 70 to 0 Panel VCB.
- Clean and megger all couplers.
- Remove covers from 0 Panel degas power center break 74, ventilate and check for methane.
- Clean and megger 0 Panel degas power center break 74
- Disconnect all couplers from 0 Panel degas power center break 74 to 0 Panel degas power center break 70.
- Clean and megger all couplers.
- Check for methane, replace covers, install input and feed through cables, and reconnect couplers from O Panel degas power centers to O Panel VCB.

Energize from O Panel VCB to O Panel section power center.

WORK TO BE DONE TO POWER UP UNDERGROUND HIGH VOLTAGE AT VENT SHAFT

9

- Remove covers from VCB on bottom, ventilate and check for methane.
 - Unplug input cable.
 - Clean and megger VCB.
 - Unplug output cable.
 - Check for methane, replace covers and input cable.
 - Energize from surface to bottom VCB.
 - Remove covers from 8 Right VCB, ventilate and check for methane.
 - Unplug input, feed through and output cables.
 - Clean and megger 8 Right VCB.
 - Disconnect all couplers from 8 Right VCB to 9 Vent VCB
 - Clean and megger all couplers.
 - Check for methane, replace covers, install input cable, and reconnect couplers from 8 Right VCB to 9 Vent VCB.
 - Energize from 9 Vent VCB to 8 Right VCB...
 - Remove covers from 9 Right VCB, ventilate and check for methane.
 - Remove covers from 9 Right belt power center, ventilate and check for methane.
 - Unplug input, feed through and output cables.
 - Clean and megger 9 Right VCB.
 - Disconnect all couplers from 9 Right VCB to 8 Right VCB
 - Clean and megger all couplers.
 - Check for methane, replace covers, install input cable, and reconnect couplers from 9 Right VCB to 8 Right VCB.
 - Energize from 8 Right VCB to 9 Right VCB.
 - Remove covers from 9 Right belt power center, ventilate and check for methane.
 - Unplug input, feed through and output cables.
 - Clean and megger 9 Right belt power center.
 - Remove covers from 9 Right section power center, ventilate and check for methane.
 - Unplug input and output cables.
 - Clean and megger 9 Right section power center.
 - Disconnect all couplers from 9 Right section power center to 9 Vent bottom VCB.
 - Clean and megger all couplers.
 - Check for methane, replace covers, install cables, and reconnect couplers from 9 Right section power center to 9 Right VCB.
 - Energize from 9 Right VCB to 9 Right section power center.
 - Remove covers from 8 Right section power center, ventilate and check for methane.
 - Unplug input and output cables.
 - Clean and megger 8 Right section power center.
 - Disconnect all couplers from 8 Right section power center to 8 Right VCB.
 - Clean and megger all couplers.
 - Check for methane, replace covers, install cables, and reconnect couplers from 8 Right section power center to 8 Right VCB.
- Energize from 8 Right VCB to 8 Right section power center.

WORK TO BE DONE TO POWER UP UNDERGROUND HIGH VOLTAGE AT VENT SHAFT

6

- Remove covers from both single vacuum breakers on bottom, ventilate and check for methane.
- Unplug all input and feed thru cables on both single vacuum breakers on the bottom
- Clean and megger all cables and couplers.
- Check for methane and replace covers and reconnect input cables to both single vacuum breakers on the bottom.
- Energize power from 6 Vent borehole to both single vacuum breakers on bottom.
- Remove covers from 4 North #1 double disconnect switch, ventilate and check for methane.
- Unplug input and feed through cables.
- Clean and megger 4 North #1 double disconnect switch.
- Remove covers from 8 East double disconnect switch, ventilate and check for methane.
- Unplug input and feed through cables.
- Clean and megger 8 East double disconnect switch.
- Remove covers from Grassy Creek #2 belt power center, ventilate and check for methane.
- Unplug input, feed through and output cables.
- Clean and megger Grassy Creek #2 belt power center.
- Clean and megger all cables and couplers
- Check for methane and replace covers, install input and feed through cables, and reconnect all couplers from Grassy #2 belt power center to 6 Vent bottom VCB.
- Remove covers from Grassy Bunker VCB, ventilate and check for methane.
- Unplug input and output cables.
- Clean and megger Grassy Bunker VCB.
- Disconnect all couplers from 4 North #1 double disconnect to Grassy Bunker VCB.
- Clean and megger all couplers and cables
- Check for methane, replace covers, install input and feed through cables, and reconnect couplers from Grassy Bunker VCB to 4 North #1 double disconnect switch.
- Energize from 6 Vent bottom to Grassy #2 belt power center and Grassy Bunker VCB.
- Unplug input cable at Grassy bunker power centers.
- Remove covers from Grassy Bunker power centers, ventilate and check for methane.
- Unplug input, feed through and output cables.
- Clean and megger Grassy Bunker power centers.
- Disconnect all couplers from Grassy Bunker power centers to Grassy Bunker VCB.
- Clean and megger all cables and couplers.
- Check for methane, replace covers, hook up input and feed through cables, and reconnect all couplers from Grassy Bunker power centers to Grassy Bunker VCB.
- Energize from Grassy Bunker VCB to Grassy bunker power centers.
- Remove covers from Grassy Creek #1 pump power center, ventilate and check for methane.
- Unplug input, feed through and output cables.
- Clean and megger Grassy Creek #1 pump power center.
- Remove covers from Grassy Creek #1 belt power center.
- Unplug input and output cables.
- Clean and megger Grassy Creek #1 belt power center.
- Disconnect all couplers from Grassy Creek #1 belt power center to Grassy Bunker VCB.

- Clean and megger all cables and couplers.
- Check for methane, replace covers, install input and feed through cables, and reconnect all couplers from Grassy Creek #1 belt power center to Grassy Bunker VCB.
- Energize from Grassy Bunker VCB to Grassy Creek #1 belt power center.

WORK TO BE DONE TO POWER UP UNDERGROUND HIGH VOLTAGE AT VENT SHAFT

10

- Remove covers from VCB on bottom, ventilate and check for methane.
- Unplug input cable.
- Clean and megger VCB.
- Unplug output cable.
- Check for methane then replace covers and input cable.
- Energize from surface to bottom VCB.
- Remove covers from 3 East #4 belt power center, ventilate and check for methane.
- Unplug input and feed through cables and all output plugs.
- Clean and megger 3 East#4 belt power center.
- Disconnect all couplers from 11 Right VCB to 10 Vent bottom VCB.
- Clean and megger all couplers.
- Remove covers from 11 Right VCB ventilate and check for methane.
- Unplug input cable.
- Clean and megger VCB.
- Unplug output cable.
- Check for methane then replace covers and input cable
- Check for methane, then replace covers, install cables, and reconnect couplers from 11 Right VCB to 10 Vent bottom VCB.
- Energize from 10 Vent bottom VCB to 11 Right VCB
- Remove covers from 12 Right VCB, ventilate and check for methane.
- Unplug input cable.
- Clean and megger VCB.
- Unplug output cable.
- Check for methane, then replace covers and input cable
- Check for methane, then replace covers, install cables, and reconnect couplers from 11 Right VCB to 10 Vent bottom VCB.
- Energize from 11 Right VCB to 12 Right VCB
- Remove covers, ventilate, and check for methane, clean and megger 3 East Mains section power center.
- Unplug input and all output cables.
- Disconnect all couplers from 3 East Mains section power center to 12 Right VCB.
- Clean and megger all couplers.
- Check for methane, then replace covers, install input cables, and reconnect couplers from 3 East Mains section power center to 12 Right VCB.
- Energize from 12 Right VCB to 3 East Mains section power center.
- Remove covers from 12 Right section power center, ventilate and check for methane.
- Unplug input cable and all output cables.
- Clean and megger 12 right section power center.
- Disconnect all couplers from 12 Right section power center to 12 Right VCB.

- Clean and megger all couplers.
- Check for methane then replace covers, install input and feed through cables, and reconnect couplers from 12 Right section power center to 12 Right VCB.
- Energize from 12 Right VCB to 12 Right section power center.
- Remove covers, ventilate, and check for methane at 11 Right section power center.
- Remove all input and output plugs.
- Clean and megger 11 Right section power center.
- Disconnect all couplers from 11 Right section power center to 11 Right VCB.
- Clean and megger all couplers.
- Remove covers, ventilate, check for methane, 11 Right degas section power center.
- Remove all input and output plugs.
- Clean and megger 11 Right degas power center break 28
- Check for methane, then replace covers, install input cables, and reconnect couplers from 11 Right section power center to 11 Right VCB.
- Energize from 11 Right VCB to 11 Right section power center.

WORK TO BE DONE TO POWER UP UNDERGROUND HIGH VOLTAGE AT #1 BOREHOLE

- 1 Ventilate Junction box at mine level Page Service Shaft**
- 2 Ventilate Mine level disconnect boxes Page Service Shaft**
- 3 Ventilate Middle Shaft Junction box Page Service Shaft**
- 4 Ventilate Sump Pump Disconnect box Page Service Shaft**
- 5 Ventilate Junction box at the mine level Page Production Shaft**
- 6 Ventilate Mine level disconnect boxes Page Production Shaft**
- 7 Ventilate Middle Shaft Junction box Page Production Shaft**
- 8 Ventilate Sump Pump Disconnect box Page Production Shaft**

- Remove covers from double disconnect switch at production shaft bottom check for methane.
- Unplug input and feed through cables.
- Clean and megger double disconnect switch at production shaft bottom.
- Remove covers from double VCB at production shaft bottom.
- Unplug input and feed through cables.
- Remove covers from double VCB at production shaft bottom.
- Clean and megger double VCB at production shaft bottom.
- Disconnect all couplers from double VCB at production shaft bottom to borehole cable.
- Clean and megger all cables and couplers.
- Check for Methane then replace covers, install input and feed through cables and reconnect all couplers from double VCB at production shaft bottom to borehole.
- Energize from surface to double VCB at production shaft bottom.
- Remove covers from production shaft power center, ventilate, check for methane, and unplug input and feed through cables and all output cables.
- Clean and megger production shaft power center.
- Remove covers from service shaft power center, ventilate and check for methane.

- Unplug input cable and all output cables.
- Clean and megger service shaft power center.
- Disconnect all couplers from service shaft power center to double VCB at production shaft bottom.
- Clean and megger all couplers and cables.
- Check for methane then replace covers, install input and feed through cables, and reconnect all couplers from service shaft power center to double VCB at production shaft bottom.
- Energize from double VCB at production shaft bottom to service shaft power center.
- Remove covers from double disconnect switch at 1 east belthead, ventilate and check for methane.
- Unplug input and feed through cables.
- Clean and megger double disconnect switch at 1 east belt head.
- Remove covers from 1 east belt power center, ventilate and check for methane.
- Unplug input and feed through cables and all output cables.
- Clean and megger 1 east belt power center.
- Remove covers from bunker power center, ventilate and check for methane.
- Unplug input and feed through cables and all output cables.
- Clean and megger bunker power center.
- Remove covers from 2 north belt power center, ventilate and check for methane.
- Unplug input and feed through cables and all output cables.
- Clean and megger 2 north belt power center.
- Remove covers from 2 east belt power center, ventilate and check for methane.
- Unplug input and feed through cables and output cables.
- Clean and megger 2 east belt power center.
- Remove covers from 3 north number 1 belt power center, ventilate and check for methane.
- Unplug input and feed through cables and output cables.
- Clean and megger 3 north number 1 belt power center.
- Disconnect all couplers from 3 north 1 belt power center to double VCB at production shaft bottom.
- Clean and megger all cables and couplers.
- Check for methane then replace covers, install input and feed through cables, and reconnect all couplers from 3 North 1 belt power center to double VCB at production shaft bottom.
- Energize from production shaft bottom to 3 North 1 belt power center.

Rehabilitation Continued...

Clean-up, stopping construction, and rock dust applications will be determined as the mine is examined by Mine Rescue Teams, Weekly Examiners, and Pre-shift Examiners.

Equipment checks:

Using the coordinate system which has been laid out for mine exploration and recovery operations,

detailed locations of equipment underground at Buchanan Mine is as follows:

Belt drives

Production – D1 – D2

1 East Mains D1 – D2
2 North Mains D1 – D2
2 East Mains C5
3 North Mains D1
Grassy Creek D1 Reclaim D61, New Bunker Drives C 61 and C64
4 North #1 C67 –D 67, 4 North #2 D9, 4 North #3 D56
3 East Mains #1 – E1, 3 East #2 E30 – E31, 3 East #3 E68, # East #4 E110
9 Right Section Belt – 3 East F88
10 Right Section Belt – 3 East F97, #2 Belt 10 Right C40
O Panel section belt – 3 East F103, #2 Belt O-Panel C40
11 Right Section belt – 3 East F111, #2 Belt 11 Right C42
12 Right Section belt – 3 East F 121

Section Equipment

3 East Mains

Left duster A124, Continuous miner A124 – B124, Continuous miner F 124, Roof Bolter E124, Shuttle cars D 121- 123, Coal Hauler C121, Scoops 1 &2 C 119-124, Charger C121 – 123, Power Center D122, Right Duster H-124, Feeder E - 124.

O – Panel

Charger B83 & B84, Shuttle Cars C87 – B87, Miner C87 – B87, Miner C89 – D89, Bolter C90 – 91, Power Center C86 – C87, Feeder C86 – C87, Shuttle Car C87 – C88, Bolter D90, Scoop E 90 – E91.

12 Right

Left bolter A7 – A8, Right bolter C7, Coal hauler B7, Shuttle cars C5 & C7, Feeder C4, Left Miner B7 – B8, Scoops B4 & B5, Chargers 1,2 & 3 B4,B5 & B6; Right Miner B1.

11 Right

Chargers B60, B61, B62 & B64; Scoop #1 B65, Fan A66, Duster A67, Left Miner A67, Left Roof Bolter A67, Scoop #2 C63, Power Center C64 – C65, Feeder C64 – C65, Shuttle Car C65, Coal Hauler C65 – C66, Right Duster D66, Right Fan D 66, Right Bolter D66, Shuttle Car C66 – C67, Miner C66 – C67.

Longwall Equipment

10 Right Setup

Scoop 590 C84, Scoop 590 2 cross cuts inby on face setup, Degas scoop and charger B75 – B76, Chargers and Batteries” 590” B79 & B78, Power Center C78 – C79.

9 Right Active Longwall

Power Center C16, Can Scoop & charger C17, Can Scoop B17, Bucket Scoop C17, Single head bolter B10

(a) **Energize battery charger and extra batteries**

- Disassemble, clean, inspect and reassemble cat head.
- Raise covers, remove all cell caps, and ventilate all batteries.
- Remove covers from charger and ventilate.

(b) **Energize coal hauler**

- Raise lids, remove all cell caps and ventilate batteries.
- Open traction controller case and vent.
- Open breaker case and vent.
- Open pump controller case and vent.
- Open all headlights and vent.
- Ventilate pump motor.
- Remove vent on tram gear cases and vent.
- Remove vent on hydraulic tank and vent.
- Remove lids and ventilate machine.

(c) **Energize continuous miner**

- Remove cover from continuous miner cat head.
- Clean inspect and replace covers on cat head.
- Remove covers on cable entrance box.
- Ventilate and replace cover.
- Remove cover on main controller case.
- Inspect ventilate and replace cover.
- Remove cover on cutter motor controller case.
- Inspect ventilate and replace cover.
- Remove cover on traction controller case.
- Inspect ventilate and replace cover.
- Disassemble headlights, inspect, ventilate, and reassemble.
- Disassemble area lights, inspect, ventilate, and reassemble.
- Change oil in traction gear cases.
- Ventilate traction motors.
- Ventilate conveyor motors.
- Ventilate cutter motors.
- Ventilate pump motor.
- Change oil in gathering head gear cases.
- Change oil in cutter head gear cases.
- Completely check permissibility on machine.
- Remove top covers and ventilate entire machine.
- Ventilate hydraulic tank.
- Energize machine.

(d) **Energize roof bolter**

- Remove cover from roof bolter cat head.
- Clean inspect and replace covers on cat head.

- Remove covers on cable entrance box.
- Ventilate and replace cover.
- Remove cover on main controller case.
- Inspect ventilate and replace cover.
- Ventilate hydraulic tank.
- Ventilate pump motor.
- Disassemble area lights ventilate, inspect and reassemble.
- Remove covers and ventilate.
- Change oil in both drill pots.
- Remove cover, inspect, ventilate, and reinstall cover on methane monitor power supply.
- Energize machine.

(e) **Energize shuttle car**

- Disassemble cat head, inspect, ventilate and reassemble.
- Remove main controller case cover.
- Inspect, ventilate and replace cover.
- Ventilate food switch.
- Ventilate operator's controller station.
- Ventilate traction motors.
- Ventilate pump motor.
- Ventilate conveyor motor.
- Change oil in conveyor speed reducer.
- Change oil in traction gear cases.
- Disassemble, inspect, ventilate and reassemble headlights.
- Change oil in wheel units.
- Ventilate hydraulic tank.
- Energize shuttle car.

(f) Energize trickle duster

- Ventilate pod.
- Remove controller cover and ventilate.
- Disassemble, inspect, clean and reassemble cat head.

(g) Energize db box

- Disassemble, clean, inspect and reassemble cat head.
- Remove covers and ventilate.

(h) Energize feeder

- Disassemble, clean, inspect and reassemble cat head.
- Remove covers and ventilate.
- Ventilate main motor.
- Ventilate controller case.
- Ventilate hydraulic tank.
- Ventilate gear case.

(i) Check list for 9 Right Longwall

- Remove Top Covers off of Power Center A and Vent.
- Remove Top Covers off of Power Center B and Vent.
- Remove Top Covers off of Power Center C and Vent.
- Unplug cables between Power Center A and Power Center B and clean.
- Unplug cables between Power Center B and Power Center C and clean.
- Open Silver Mine Phone at the Pump Station and Vent
- Unplug Stage Loader Plug and Clean (at starter car).
- Unplug Crusher Plug and Clean (at starter car).
- Unplug #1 Motor Plug and Clean (at starter car).
- Unplug #2 Motor Plug and Clean (at starter car).
- Unplug Tail Motor Plug and Clean (at starter car).
- Unplug Shearer Plug and Clean (at starter car).
- Unplug #1 Pump Plug and Clean (at starter car).
- Unplug #2 Pump Plug and Clean (at starter car).
- Unplug #3 Pump Plug and Clean (at starter car).
- Unplug #4 Pump Plug and Clean (at starter car).
- Unplug 600V Plug for Head Gate Box and Clean (at starter car).
- Unplug Booster Plug and Clean (at starter car).
- Unplug Data Control Line to Head Gate and Clean (at starter car).
- Unplug Data Control Line to Pumps and Clean (at starter car).
- Unplug Scoop Charger Plug and Clean (at power center A).
- Unplug Winch Plug and Clean (at power center A).
- Unplug Transfer Pump Plug and Clean (at power center A).
- Remove Permissible J-Box Cover on #1 Pump.
- Remove Permissible J-Box Cover on #2 Pump.
- Remove Permissible J-Box Cover on #3 Pump.
- Remove Permissible J-Box Cover on #4 Pump.
- Unplug #1 Pump Plug and Clean (at the motor j-box).
- Unplug #2 Pump Plug and Clean (at the motor j-box).
- Unplug #3 Pump Plug and Clean (at the motor j-box).
- Unplug #4 Pump Plug and Clean (at the motor j-box).
- Change Oil in #1 Pump.
- Change Oil in #2 Pump.
- Change Oil in #3 Pump.
- Change Oil in #4 Pump.
- Open Top Cover on Pump Tank Car for Raw Emulsion.
- Open Top Cover on Pump Tank Car for Mixed Emulsion.
- Open Starter Box on Pump Car and Vent
- Open Section Computer (on charger car) and Vent.
- Open Scoop Charger (on charger car) and Vent.

- Open Traction Controller Case on 488 Scoop and Vent.
- Open Breaker Case on 488 Scoop and Vent.
- Open Pump Controller Case on 488 Scoop and Vent.
- Open All Four Headlights on 488 Scoop and Vent.
- Lift Lids on Battery Trays on 488 Scoop and Vent.
- Open Traction Motor Inspection Lid on 488 Scoop and Vent.
- Remove Vent on Tram Speed Reducer on 488 Scoop and Vent.
- Remove Vent on Front Differential on 488 Scoop and Vent.
- Remove Vent on Rear Differential on 488 Scoop and Vent.
- Remove Vent on Hydraulic Tank on 488 Scoop and Vent.
- Open All Tool Boxes on Car and Vent.
- Unplug Stage Loader Plug and Clean (at motor j-box).
- Change Oil in Stage Loader Gearbox.
- Remove Permissible J-Box Cover on Stage Loader.
- Change Oil in Stage Loader Winch.
- Unplug Crusher Plug and Clean (at motor j-box).
- Remove Permissible J-Box Cover on Crusher.
- Open the following DAC Face Line Phones and Vent: Master Phone, Tailpiece, Stage Loader, Shield #9, Shield #19, Shield #29, Shield #39, Shield #49, Shield #59, Shield #69, Shield #79, Shield #89, Shield #99, Shield #109, Shield #119, Shield #129, Shield #139, Shield #149, Shield #159, and Shield #169.
- Open Yellow and Silver Mine Phones at the Head Gate and Vent.
- Open All Permissible Doors on the Master Control and Vent.
- Unplug All Control Leads Coming to Master Control and Clean Catheads.
- Open Permissible Door on Shearer Disconnect Box and Vent.
- Unplug Incoming and Outgoing Catheads on the Shearer Disconnect Box and Clean
- Open the Tail Face Motor J-Box and Vent.
- Unplug #1 Motor Plug and Clean (at motor j-box).
- Change Oil in #1 Gearbox.
- Remove Permissible J-Box Cover on #1 Motor.
- Unplug #2 Motor Plug and Clean (at motor j-box).
- Change Oil in #2 Gearbox.
- Remove Permissible J-Box Cover on #2 Motor.
- Remove Permissible Cover and Vent on the Following Light Power Supplies at These Locations: Master Control, Shield # 2, Shield #21, Shield #41, Shield #61, Shield #81, Shield #101, Shield #121, Shield #141, Shield #161, and Shield #169.
- Unplug Incoming and Outgoing Power Cables and Clean Catheads on the Following Light Power Supplies at These Locations: Master Control, Shield # 2, Shield #21, Shield #41, Shield #61, Shield #81, Shield #101, Shield #121, Shield #141, Shield #161, and Shield #169.
- Take Luminaries Apart and Vent From Head to Tail.
- Remove Permissible Cover and Vent on the Following Shield Power Supplies at These Locations: Shield #42 and Shield #102.
- Unplug Incoming and Outgoing Power Cables and Clean Catheads on the Following Shield Power Supplies at These Locations: Shield #42, Shield #102.

- Open Mid-face J-Box for Shearer and Vent.
- Open Hydraulic Box for Tail Tensioner and Vent.
- Open Permissible Box for Tail Tensioner and Vent.
- Change Oil in Tail Gearbox.
- Remove Permissible J-Box Cover on Tail Motor.
- Unplug Tail Motor Plug and Clean (at motor j-box).
- Change Oil in Head Ranging Arm (shearer).
- Change Oil in Head Haulage Gearbox (shearer).
- Change Oil in Head Hydraulic Tank (shearer).
- Change Oil in Tail Ranging Arm (shearer).
- Change Oil in Tail Haulage Gearbox (shearer).
- Change Oil in Tail Hydraulic Tank (shearer).
- Open Head Cutter Motor J-Box and Vent (shearer).
- Open Tail Cutter Motor J-Box and Vent (shearer).
- Open All Three Doors on Controller Case and Vent (shearer).

(j) Checklist for 10 Right Longwall

- Remove Top Covers off of Power Center A and Vent.
- Remove Top Covers off of Power Center B and Vent.
- Remove Top Covers off of Power Center C and Vent.
- Unplug cables between Power Center A and Power Center B and clean.
- Unplug cables between Power Center B and Power Center C and clean.
- Open Silver Mine Phone at the Pump Station and Vent
- Uncap Stage Loader Plug and Clean (at starter car).
- Uncap Crusher Plug and Clean (at starter car).
- Uncap #1 Motor Plug and Clean (at starter car).
- Uncap #2 Motor Plug and Clean (at starter car).
- Uncap Tail Motor Plug and Clean (at starter car).
- Uncap Shearer Plug and Clean (at starter car).
- Unplug #1 Pump Plug and Clean (at starter car).
- Unplug #2 Pump Plug and Clean (at starter car).
- Unplug #3 Pump Plug and Clean (at starter car).
- Unplug #4 Pump Plug and Clean (at starter car).
- Unplug 600V Plug for Head Gate Box and Clean (at starter car).
- Unplug Booster Plug and Clean (at starter car).
- Unplug Data Control Line to Head Gate and Clean (at starter car).
- Unplug Data Control Line to Pumps and Clean (at starter car).
- Unplug Scoop Charger Plug and Clean (at power center A).
- Remove Permissible J-Box Cover on #1 Pump.
- Remove Permissible J-Box Cover on #2 Pump.
- Remove Permissible J-Box Cover on #3 Pump.
- Remove Permissible J-Box Cover on #4 Pump.
- Unplug #1 Pump Plug and Clean (at the motor j-box).
- Unplug #2 Pump Plug and Clean (at the motor j-box).

- Unplug #3 Pump Plug and Clean (at the motor j-box).
- Unplug #4 Pump Plug and Clean (at the motor j-box).
- Change Oil in #1 Pump.
- Change Oil in #2 Pump.
- Change Oil in #3 Pump.
- Change Oil in #4 Pump.
- Open Top Cover on Pump Tank Car for Raw Emulsion.
- Open Top Cover on Pump Tank Car for Mixed Emulsion.
- Open Starter Box on Pump Car and Vent
- Open 590 Scoop Charger #1 and Vent.
- Open Traction Controller Case on 590 #1 Scoop and Vent.
- Open Breaker Case on 590 #1 Scoop and Vent.
- Open Pump Controller Case on 590 #1 Scoop and Vent.
- Open All Four Headlights on 590 #1 Scoop and Vent.
- Lift Lids on Battery Trays on 590 #1 Scoop and Vent.
- Open Traction Motor Inspection Lid on 590 #1 Scoop and Vent.
- Remove Vent on Tram Speed Reducer on 590 #1 Scoop and Vent.
- Remove Vent on Front Differential on 590 #1 Scoop and Vent.
- Remove Vent on Rear Differential on 590 #1 Scoop and Vent.
- Remove Vent on Hydraulic Tank on 590 #1 Scoop and Vent.
- Open 590 Scoop Charger #2 and Vent.
- Open Traction Controller Case on 590 #2 Scoop and Vent.
- Open Breaker Case on 590 #2 Scoop and Vent.
- Open Pump Controller Case on 590 #2 Scoop and Vent.
- Open All Four Headlights on 590 #2 Scoop and Vent.
- Lift Lids on Battery Trays on 590 #2 Scoop and Vent.
- Open Traction Motor Inspection Lid on 590 #2 Scoop and Vent.
- Remove Vent on Tram Speed Reducer on 590 #2 Scoop and Vent.
- Remove Vent on Front Differential on 590 #2 Scoop and Vent.
- Remove Vent on Rear Differential on 590 #2 Scoop and Vent.
- Remove Vent on Hydraulic Tank on 590 #2 Scoop and Vent.
- Open All Tool Boxes and Vent.
- Open Mid-face J-Box for Shearer and Vent.
- Open Hydraulic Box for Tail Tensioner and Vent.
- Open Permissible Box for Tail Tensioner and Vent.
- Change Oil in Tail Gearbox.
- Remove Permissible J-Box Cover on Tail Motor.
- Unplug Tail Motor Plug and Clean (at motor j-box).
- Change Oil in Head Ranging Arm (shearer).
- Change Oil in Head Haulage Gearbox (shearer).
- Change Oil in Head Hydraulic Tank (shearer).
- Change Oil in Tail Ranging Arm (shearer).
- Change Oil in Tail Haulage Gearbox (shearer).
- Change Oil in Tail Hydraulic Tank (shearer).
- Open Head Cutter Motor J-Box and Vent (shearer).

- Open Tail Cutter Motor J-Box and Vent (shearer).
- Open All Three Doors on Controller Case and Vent (shearer).

(k) **BELT DRIVE INSTALLATIONS**

- Disassemble, clean, inspect and reassemble cat head.
- Remove covers and ventilate belt starter.
- Remove junction box covers on belt motors, inspect, ventilate and reassemble.
- Ventilade and change oil in belt speed reducers.
- Open cover for take-up hydraulic tank, inspect and ventilate.
- Remove covers and ventilate take-up controller.
- Ventilade belt drive motors.
- Remove chain guards, ventilate, and refill with oil if provided.