Upper Big Branch Mine
April 5th 2010

MASSEY ENERGY COMPANY

PRELIMINARY REPORT OF INVESTIGATION
UPPER BIG BRANCH MINE EXPLOSION
APRIL 5, 2010
EXECUTIVE SUMMARY

On April 5, 2010, an explosion at Performance Coal Company’s Upper Big Branch (“UBB”) mine in Raleigh County, West Virginia, resulted in the deaths of 29 miners. Because the UBB accident involved an explosion, the subsequent investigations of both the government and Performance have focused on the source of fuel that generated it; whether coal dust played a role; and whether the quality of ventilation underground contributed to the disaster. From the moment that Performance removed its last fallen members from the mine, it has devoted itself to learning the cause of this tragedy by conducting an open, independent, and objective investigation that is worthy of the members it lost.

The federal Mine Safety and Health Administration (“MSHA”), however, has organized its investigation around a single principle: to find evidence in support of its claim that Performance caused the accident, an accusation that MSHA hastily leveled at the company within a week of the explosion and before any investigation had commenced. The government has ignored compelling evidence of a natural disaster and, instead, focused single-mindedly on any factors that were conceivably within Performance’s control. Consequently, MSHA has disregarded all scientific data demonstrating that a massive gas inundation caused the explosion, preferring instead to point to coal dust, which the government typically believes to be within an operator’s scope of responsibility.

If the data supported the conclusion that Performance was at fault, we would have embraced that conclusion and devoted our energies to addressing any shortcomings in processes, maintenance, training, or safety programs. However, the scientific data that Performance has painstakingly assembled over the last year with the assistance of a team of nationally renowned experts so far compels at least five conclusions: First, a massive inundation of natural gas caused the UBB explosion and coal dust did not contribute materially to the magnitude or severity of the blast; second, although an ignition source may never be determined, the explosion likely originated in the Tailgate
21 entries, but certainly not as the result of faulty shearer maintenance; third, Performance adequately rock dusted the mine prior to the explosion such that coal dust could not have played a causal role in the accident; fourth, the mine’s underground ventilation system provided significantly more fresh air than required by law and there is no evidence that ventilation contributed to the explosion; and, fifth, MSHA has conducted a deeply flawed accident investigation that has been predicated, in part, upon secrecy, protecting its own self-interest, witness intimidation, obstruction of Performance’s investigators, and retaliatory citations.

**Conclusion One: Contrary to the Government’s Assertions, a Massive Inundation of Natural Gas, Rather than Coal Dust, Caused the UBB Explosion.**

The evidence establishes that an inundation of natural gas caused the UBB explosion. Immediately after the accident, MSHA captured gas samples from air exiting from the mine’s exhaust fan. These samples show conclusively that the mine experienced a massive inundation of natural gas that was distinct in its composition from ordinary coal bed methane. Indeed, fully five hours after the explosion, the mine continued to liberate more than two times the amount of gas ordinarily released during production. As time passed, the natural gas leaving the mine decreased such that the overall gas mixture in the exhaust air trended back towards a ratio more characteristic of coal bed methane, which is what the mine normally would have exhausted absent the inundation of external natural gas. Not until seven months after the accident did the mine return to exhausting pure coal bed methane.

The gas monitoring equipment—both hand-held and equipment-mounted—located throughout the mine at the time of the accident also revealed that the natural gas arose suddenly and rapidly insofar as the monitors detected no elevated gas levels in the hours or minutes before the inundation. Just minutes beforehand, several miners in the area called out pre-shift examination reports that indicated no elevated methane levels, no suspicious floor cracks or anything else out of the ordinary. Hand-held methane detectors (which detect flammable gas, including methane,
ethane, and propane) recovered from victims at three different locations underground all reported normal readings leading up to the explosion and then exceeded measurable maximum readings of carbon monoxide and methane at or immediately after the explosion. In addition to these hand-held detectors, none of the equipment-mounted methane monitors – all of which were proved to have been operating correctly at the time of the explosion and none of which was disabled or “bridged out” – recorded elevated flammable gas levels just prior to the explosion.

Expert investigation also has determined that the mine environment and physical evidence – particularly evidence of explosive forces and thermal markers – provide an explosion “footprint” that is characteristic of a gas explosion and flatly inconsistent with a dust explosion. Unlike a gas explosion, a coal dust explosion requires initial pressures to lift and suspend the coal dust in order for it to participate in an explosion. Of vital importance to the propagation of a coal dust explosion is that the initial explosion, whatever the cause, must be sufficient to lift the dust ahead of the explosion wave in order for the reaction to continue. The scientific literature indicates that pressures required to lift and suspend coal dust for combustion propagation are significant. UBB sustained relatively limited overpressure damage, however, which provides compelling evidence that the overpressures from the UBB explosion were below the levels required to lift coal dust and sustain a propagating dust explosion.

In addition, the physical evidence underground indicates that much of the heating damage in the affected area is attributable to hot gases, rather than direct flames that persist for a longer time in dust explosions than in gas explosions. Indeed, the UBB explosion had a fairly limited flame front and sporadic heating zones, which is indicative of rich gas cloud combustion that only sporadically mixes with enough air to reenter the flammable range, resume combustion, revive the flame front, and cause heating damage. A coal dust explosion, by contrast, combusts continuously, not sporadically, and, unlike a gas explosion, can only continue to propagate if the coal dust continues to
burn. There is nothing at UBB even resembling the level of destruction and effects that would have been associated with a coal dust explosion. The discrete and sporadic zones of flame and heating at UBB, therefore, could not have been caused by a propagating coal dust explosion, particularly the type of “massive” coal dust explosion imagined by MSHA.

The thermal damage to physical evidence in the affected areas shows a clean and relatively thin gas flame front, and no sign of exposure to combusting coal dust. Coal dust combustion leaves characteristic markers, such as combusted coal dust particles that have embedded themselves in an item. Analysis of objects in the affected area of UBB strongly indicates damage caused by gas. For instance, bags of concrete showed only light charring in one spot and were coated with a layer of coal dust that had not combusted when it landed on the bags. Plastic on a speaker was melted by a clean heat source, but had no burning coal dust particles imbedded in it. Likewise, a plastic light cover was melted from the explosion’s heat and stretched in one direction from explosion winds, but the coal dust that covered it was easily brushed off, leaving no imbedded dust particles. These are but a few examples; the affected area of UBB is filled with similar objects utterly lacking evidence of exposure to combusting coal dust particles. Consequently, the explosion footprint corroborates the contemporaneous gas samples and underground detection technology, all of which demonstrate that a massive inundation of natural gas fueled the explosion, not coal dust.

Conclusion Two: Although an Ignition Source May Never Be Determined Conclusively, the Explosion Likely Originated in the Tailgate 21 Entries, But Certainly Not as the Result of Faulty Shearer Maintenance.

Experts in fire and explosion dynamics and structural engineering have concluded that, although an ignition source may never be determined, the explosion likely originated in the Tailgate 21 entries, but certainly not as the result of faulty shearer maintenance. By examining damage to objects in the mine, these experts have determined the direction in which the blast wave travelled and, as a result, can at least rule out certain areas of the mine as likely sources of ignition. One such
area is the longwall, where a noticeable absence of force indicators and thermal damage eliminates it as the origin of the explosion. Indeed, a number of thermally sensitive items located on the longwall had little, if any, thermal damage, including paper signs, insulation on electrical cables, and plastic labeling on electrical boxes.

By sharp contrast, the portion of the longwall nearest the tailgate shows explosion effects, indicating a force originating in Tailgate 21 that sent an overpressure wave away from the longwall toward other sections of the mine. This pathway is consistent with all of the damage patterns evident in the mine sections affected by the blast. Despite isolating Tailgate 21 as the most likely point of origin, however, the ignition source of the UBB explosion still has not been identified with certainty and may never be ascertained. This is not uncommon in investigations of complex industrial explosions.

Despite the contrary evidence, the government has settled upon the longwall shearer as the ignition source. As with other aspects of the government’s investigation, its theory cannot be reconciled with the evidence. To be sure, the shearer, in normal operation, tends to emit sparks and, thus, ought to have been considered as a potential ignition source. It remains an improbable source of ignition, however, because it only creates sparks while in operation. On April 5, 2010, the longwall crew shut down the shearer at approximately 2:59 p.m., more than two minutes before the explosion. The government’s fixation on the condition of the shearer’s cutting bits and water sprays is also entirely beside the point. A longwall shearer, as it cuts through coal, emits sparks regardless of the bits’ condition; there is nothing to suggest that normally worn bits cause more sparking during the mining process. As for the water sprays on the shearer, they are designed for dust suppression only; there is, therefore, no reason to conclude that a full set of new water sprays would have extinguished a gas ignition. Moreover, if any water sprays had gotten knocked out, it likely would have caused more water to enter the environment, not less.
The record also demonstrates that the UBB longwall crew regularly replaced bits and sprays at the end of a pass of the longwall or during other routine maintenance. In fact, at 11:00 a.m. on the morning of the accident, the headgate operator of the longwall notified the dispatcher that 25 bits had been replaced. Additionally, the longwall was down until less than an hour prior to the accident because of a maintenance issue; if any cutting bits needed replacement they would have been replaced then. Indeed, an actual examination of the shearer has shown that the cutting bits were in very good condition, with the exception of two lead bits that are specifically designed to wear down.

The government’s ignition theory, therefore, like its coal dust theory, finds no support in the record.

**Conclusion Three: Performance Adequately Rock Dusted the Mine Prior to the Explosion.**

Performance’s records demonstrate that it applied rock dust to the mine in amounts that exceeded federal requirements. Between January 1, 2010 and the day of the accident, Performance dispersed approximately 1,750,000 pounds of rock dust underground at UBB, which amounts to over 18,500 pounds per calendar day. Rock dusting at UBB exceeded MSHA standards by a substantial factor. Even visual inspections throughout the mine after the accident have revealed a layer of rock dust immediately beneath the thin layer of matter deposited by the explosion.

Despite the government’s current effort to attribute the explosion to coal dust, its contemporaneous inspections and own dust sampling also demonstrates that Performance applied adequate amounts of rock dust. MSHA conducted 106 inspector visits of the UBB mine between January 1 and April 5, 2010, spending more than 650 hours on site, an average of 7.25 hours per calendar day. During that time, the agency inspected all five working sections of the mine and issued no extraordinary rock dust violations or orders. Moreover, notes from MSHA inspectors mention with particularity that the mine did not lack sufficient rock dust, and the most recent
MSHA rock dust samples taken in the affected areas of UBB prior to the explosion were fully compliant with applicable regulatory standards.

MSHA’s current effort to repudiate its own pre-explosion inspection data is fundamentally flawed. The agency has used post-explosion dust samples to conclude that the mine lacked sufficient rock dust before the explosion. MSHA’s reliance upon post-explosion samples, however, is at odds with more than a half century of scientific study, which has long understood that because of dust dispersion and coal dust generation during an explosion, the original composition of mine dust at a given location cannot be calculated accurately from analysis of samples collected after an explosion. In a post-explosion environment such as UBB, sampled materials certainly would have been contaminated by the voluminous coal dust created by the forces and impacts of the explosion, thus artificially elevating the samples’ combustible content.

**Conclusion Four: There Is No Evidence the UBB Ventilation System Played Any Role in the Explosion.**

UBB’s ventilation system, although adversely impacted by modifications imposed upon it by MSHA, provided significantly more than the legally required amount of fresh air in the mine on the day of the accident. Although federal law holds mine operators responsible for designing and implementing safe ventilation systems, MSHA must approve all plans and MSHA’s practice in UBB’s district was to notify operators orally that it would not approve a plan unless changed to comport with MSHA’s subjective determination of what was best for a mine. By proceeding in this manner, MSHA eliminated any written record of its central role in ventilation design and it also left an operator without recourse to a legal challenge because there was no official MSHA position to appeal. Ultimately, the agency wrung concessions out of operators by shutting them down until they accepted deviations from an operator’s preferred plan.

UBB’s mine ventilation plan is the poster child for this flawed process: In at least two instances MSHA forced Performance to alter its preferred ventilation plan in a manner that
Performance believed was less safe than its own plan and that had a negative impact on ventilation in those areas of the mine most affected by the explosion. Approximately one month before the explosion, numerous MSHA inspectors conducted a ventilation blitz at UBB, but actually found that the areas of the mine where the explosion ultimately was to occur had more air ventilating it than required by law. MSHA nevertheless ordered Performance to alter the flow of air on the tailgate section of its longwall, which was contrary to the previously approved ventilation plan and which reduced average longwall face ventilation by more than 22 percent.

Approximately two weeks later, shortly before the explosion, MSHA also ordered Performance not to ventilate its longwall with air that had travelled over conveyor belts, even though MSHA previously approved that plan. The use of such “belt air” had allowed Performance to direct significantly more air across the longwall face. Perplexingly, MSHA justified its reversal of position on the grounds that UBB did not liberate enough methane to warrant the use of belt air, though the agency itself previously had warned Performance that, by statutory definition, UBB was a gassy mine and that “due to its methane liberation . . . inadequate ventilation on a working section is both an ignition and explosion hazard.” In any event, the belt air was reversed, as required by MSHA, in late March 2010. Following the belt air reversal, the flow of air ventilating the longwall face dropped approximately 44 percent from what it had been just a month earlier.

Despite the dramatic reduction of air, the evidence establishes that UBB’s ventilation system functioned properly on the day of the explosion, despite MSHA’s misjudgments. In the half hour before the accident, the foremen of all three sections in the area of the explosion called out their pre-shift reports and none reported anything out of the ordinary. Indeed, section airflows exceeded the regulatory and plan minimums. Additionally, numerous other experienced miners had traveled in and around that area that day also without detecting anything at all consistent with a compromised ventilation system, and the fan charts for the UBB exhausting fan show unequivocally
that ventilation was not impeded on the day of the explosion. As mentioned above, the UBB accident was the result of a sudden and massive inundation of natural gas that ignited, not any failure of UBB’s ventilation system. The ventilation system ultimately is relevant only insofar as MSHA’s doubts about its own role in UBB’s ventilation plan might account for its persistent efforts to prevent an open, honest, and aggressive investigation of the causes of the explosion.

**Conclusion Five: MSHA Has Conducted a Deeply Flawed Accident Investigation.**

Before Performance had even removed all of its fallen members from the mine, the Department of Labor and MSHA launched an investigation into the accident with the intent of identifying a cause and naming a perpetrator within a week. Although MSHA closed off the mine from any underground investigation for nearly three months to allow conditions to improve, MSHA nevertheless affixed blame in the interim: On April 15, 2010, MSHA announced to the world that the UBB tragedy was “a failure first and foremost of management,” attempting not only to blame Massey, but also to divert attention from MSHA’s own involvement in UBB mine inspections and ventilation plans. Having committed itself unambiguously and publicly to this position, MSHA then set out to support it. In the year that has passed since the accident, MSHA has conducted an investigation unworthy of its statutory responsibility to protect the health and safety of miners:

*First,* MSHA lured witnesses, sometimes under false pretenses and often without an attorney or representative, to interviews, where it framed questions to induce testimony that only supported MSHA’s conclusions. Because the Mine Act plainly requires compelled testimony to occur in a public forum, MSHA co-opted the state agency’s subpoena authority to haul witnesses into interviews only to subject those individuals to an interrogation conducted largely by MSHA, rather than the State.

*Second,* although Performance has a statutory right and mandate to investigate the cause of the UBB accident, MSHA imposed on Performance an underground investigation protocol that
deviated substantially from the protocols employed in past accident investigations—including the protocols used most recently by MSHA following the Sago explosion in 2006—and which prohibited the company from utilizing basic and essential investigative tools, such as photography, modern mine mapping, and independent dust sampling. Although the protocol was imposed under the pretext of safety, it succeeded only in limiting the quantity and quality of the data that was collected. It also dramatically increased the chances that Massey would irrevocably lose the opportunity to preserve critical evidence in the mine, which degraded rapidly after the accident. Most important, MSHA prevented the development of a full evidentiary record.

Third, what MSHA could not gain through a natural degradation of the mine, it sought to achieve more directly by attempting to coerce Performance to destroy evidence. As the record demonstrates, MSHA repeatedly threatened to issue citations against Performance when the company refused to destroy potentially critical evidence, namely, by ordering Performance to apply rock dust or water to areas still under investigation by the company.

Fourth, MSHA’s Chief Investigator, Norman Page, has knowingly and repeatedly obstructed and sought to intimidate Performance’s experts and investigators. Recognizing that the science does not support MSHA’s snap judgment about the accident, Mr. Page has repeatedly ordered the withdrawal of Performance’s scientific experts from the mine without a good faith basis; has issued retaliatory citations and orders against Performance’s experts; and even has orchestrated a closed-door confrontation of a counsel-retained expert in which Mr. Page unambiguously threatened future retaliatory orders against the expert – in this investigation and any others – if the expert challenged MSHA’s conclusions.

In light of the above, the government cannot currently say with any reasonable confidence that Performance management or its members caused the UBB tragedy. The overwhelming weight of the scientific data indicates that a massive inundation of natural gas, rather than coal dust, caused
the UBB explosion. Moreover, the evidence does not disclose any failure by Performance that contributed to the explosion or to the number of fatalities, particularly in the areas of rock dusting, ventilation or shearer maintenance. Performance fully intends to rely on these findings and any other data to determine what might be done to mitigate or prevent such accidents in the future.

I. BACKGROUND

Massey Energy has operated the UBB mine since 1994 through Performance Coal Company, which is a Massey subsidiary. Located in Montcoal, West Virginia, approximately 30 miles south of Charleston, UBB is an underground bituminous coal mine that historically has produced an abundant supply of highly valuable metallurgical coal. Performance has extracted coal using two mining methods: “longwall” mining and “room and pillar” continuous mining. A basic knowledge of both is essential to understanding the tragic events at UBB.

The UBB Longwall and the Continuous Miner Sections

At the time of the UBB accident, Performance had one active longwall panel and three active continuous mining sections.¹ Longwall mining is a method of extraction in which an operator removes coal in one operation by means of a long working wall, otherwise known as “the face.” The longwall mining machine (“shearer”) utilizes two cutting heads and advances making a thin cut—approximately three and a half feet deep at UBB—in a continuous line, which may be one thousand feet or more in length. The space from which the coal is removed, which is referred to as “the gob,” is allowed to collapse behind the mining crew, who are protected overhead by large metal roof-supporting “shields” that are supported by powerful hydraulic jacks. The shields are approximately six feet wide and placed in a long line, side-by-side, for the entire length of the longwall in order to support the roof of the face. Power for the longwall comes from a row of

¹ A fourth continuous mining section was idle at the time of the accident.
electrical and hydraulically powered machinery – nicknamed the “mule train” – that is located in the headgate entry well in advance of the longwall panel and is moved frequently as the working face retreats. At UBB, the longwall retreated from the furthermost point inside the mine (“inby”) towards the portal openings (“outby”).

The longwall face is bracketed on both sides by passages (or “entries”) that travel the entire length of the original block of coal for the longwall, thus extending along the entire gob. The entry towards the top of the map (or to one’s left if looking towards the working face) of the UBB longwall face, from which fresh air enters and to which the mined coal is conveyed, is referred to as the “headgate.” The entry towards the bottom on the map (or to one’s right if looking at the face), where the air along the face emerges to exit the mine, is called the “tailgate.” During operation of the longwall, fresh air travels from the headgate, across the face, and then down the tailgate to exit the mine in order to prevent the buildup of coal dust or harmful mine gases, such as methane. Once past the face, the air is no longer fresh air because it contains dust and mine gases and is, thus, referred to as “return air.” Mounted ventilation fans on the surface force or draw the return air outside. Once an operator depletes the coal reserves contained in a set of longwall panels, those panels often are sealed off from the active sections of the mine.

Far from the large-scale harvest of coal that results from the longwall, “room and pillar” mining involves a more modest extraction through continuous miner machines that create open passages (“entries” or “crosscuts”) underground, leaving pillars of coal to support the roof. The pillars are engineered to be big enough to support the roof without leaving excessive quantities of valuable coal in the pillars. The load-bearing capacity of the coal itself, the strength of rock layers overhead and below, the presence of other workings above or below, and the underground depth at which mining is performed dictate pillar size. Not only does an operator need to be cognizant of avoiding roof falls and pillar failures, but the passages created by the continuous miner also must
facilitate underground ventilation and establish sturdy headgates and tailgates for the longwall.

The room and pillar method ultimately creates an underground grid that, when viewed from above on a mine map, resembles city streets, blocks and intersections. The passages driven from the outside portal into the mine are referred to as “entries;” the intersecting passages are called “crosscuts;” and the intersection itself is termed a “break.” So, for example, in the UBB mine, a reference to “78 Break” means an area approximately 78 intersections (or pillars) into the mine from a particular starting point.

By contrast, an event’s or individual’s location on the longwall face is identified by reference to the numbered shields that stand along the working face. At UBB, the longwall panel is approximately 1,000 feet long and contains 176 shields that numerically begin at the headgate and end at the tailgate. Consequently, if a longwall operator is, for example, located at Shield #150, then he is approximately 850 feet from the headgate and 150 feet from the tailgate.

Preventive Measures: Ventilation and Rock dusting

Proper ventilation of a coal mine plays an exceedingly important role in removing harmful coal dust and gases, like methane. The coal bed methane found in the seams in the area of the UBB mine is composed of nearly 100 percent methane. Methane is a light gaseous hydrocarbon, while ethane and propane are heavier gaseous hydrocarbons. The coal bed methane emitted from the Eagle seam, which is the seam mined at UBB, consists of roughly 99.94 percent methane, .05 percent ethane, and .02 percent propane.

Natural gas produced from gas wells in this area of West Virginia, as compared to coal bed methane, is much more mature, comes from much deeper in the ground, and generally contains much higher proportions of ethane and propane than coal bed methane. As discussed in greater detail, in Section II, infra, gas samples taken after the explosion within the UBB mine from cracks in the floor along the longwall face were composed of approximately 91 percent methane, 6 percent
ethane, and 3 percent propane, values typically found in natural gas wells. Furthermore, gas samples taken by MSHA from Performance’s surface exhausting fan, known as the Bandytown fan, immediately after the explosion contained proportions of methane and ethane nearly identical to those of the natural gas from the gas wells and from the floor cracks. Plainly, the gas liberated from the fan and the longwall cracks was the same natural gas, not coal bed methane.

Besides ventilating a mine to minimize dangerous concentrations of methane, an operator must also neutralize coal dust buildup, which if activated by a methane explosion could provide fuel for an additional, more-catastrophic coal dust explosion. To prevent coal dust from contributing to such an explosion, a mine operator must routinely cover the floors, walls and roofs of mine entries with inert rock dust, such as pulverized limestone. Federal regulations dictate that rock dust must be applied underground to bring the dust in a mine above specified incombustible content levels.

Performance’s records demonstrate that it exceeded federal rock dust requirements at UBB. Between January 1, 2010 and the day of the accident, Performance applied 1,750,000 pounds of rock dust to the mine, which amounts to over 18,500 pounds of rock dust per calendar day. Indeed, more than six bulk bags of rock dust per run day were applied on the continuous miner sections. The inspection reports compiled by Massey employees reflect scrupulous attention to the need to routinely clean coal dust off belt lines and equipment and to apply rock dust regularly. Other contemporaneous reports confirm that the issues noted by inspectors were promptly addressed. Rock dusting at UBB, therefore, exceeded MSHA standards by a substantial factor. Even visual inspections throughout the mine after the accident have revealed a layer of rock dust immediately beneath the thin layer of particulate matter and other contaminants that were deposited by the explosion.

Despite the government’s current effort to attribute the explosion to coal dust, its own inspections and pre-explosion dust sampling demonstrate that Performance applied adequate rock
dust. MSHA conducted 106 inspector visits of the UBB mine between January 1 and April 5, 2010, spending more than 650 hours on site, an average of 7.25 hours per calendar day. During that time, the agency inspected all five working sections of the mine and issued no extraordinary rock dust violations or orders. Moreover, in the weeks and months before the explosion, MSHA conducted rock dust surveys in the relevant areas of UBB that were entirely compliant with applicable legal standards.

The Events of April 5, 2010

In early 2009, Performance moved forward on its plans to mine a new longwall panel in UBB—Panel 21—by driving tailgate and headgate entries out to the Bandytown fan using continuous miner crews. By September, with entries on both sides driven out to the fan and the longwall machinery fully installed, Performance began mining the longwall face, proceeding up the panel between Headgate 21 and Tailgate 21. Shortly thereafter, Performance deployed its continuous miner crews to prepare for the next longwall panel—Panel 22—which existed alongside Panel 21, separated initially only by Headgate 21. Consistent with past practice, the continuous miner crews began driving a headgate for the next panel, anticipating that Headgate 21 would become the tailgate for Panel 22. Due to unfavorable conditions in the existing Headgate 21, crews subsequently prepared a new tailgate (Tailgate 22) for the future panel. Consequently, by April 2010, Performance employed a longwall crew on Panel 21; a continuous miner crew on Headgate 22; and a continuous miner crew on Tailgate 22. These crews, particularly the longwall crew, were among some of Massey’s most experienced and well-trained members.
Apart from two ventilation changes imposed upon Performance by MSHA, both of which reduced air flow on the longwall, the days preceding the accident were not out of the ordinary at UBB. Performance continued to mine one active longwall panel and three active continuous mining sections. The company did, however, reduce production on the prior weekend in order to observe the Easter holiday. Accordingly, Performance modified its schedule by shutting down the outby “barrier” and the Tailgate 22 continuous miner sections on Saturday April 3, and then halting operation of the longwall and all three continuous miner sections on Easter Sunday. Operations resumed in full the next day, Monday, April 5.

On the day of the accident, April 5, all UBB operations and activities continued to be normal and no one identified or reported any unusual, dangerous, or unsafe conditions underground. None of the pre-shift inspections, required by federal law, identified any unusual or dangerous conditions. Throughout the morning, the longwall crew and its supervisor were working the entire longwall from headgate to tailgate, and none reported any problems relating to dust, methane, or floor cracking. At 2:38 p.m. pre-shift examiner Steve Harrah called out his report for Tailgate 22, indicating no problems. At 2:40 p.m. Rick Lane called out his pre-shift report for the longwall,
having walked and examined the entire face, headgate entries, and tailgate entries and finding no problems. Fifteen minutes later, Dean Jones called out his pre-shift examination for Headgate 22, also reporting no problems. At approximately 3:00 p.m.—only after the pre-shift inspections confirmed that conditions in the mine were safe—a track vehicle (“mantrip”) carrying the Tailgate 22 crew that had just ended its shift called for and received track clearance at 78 Break to proceed outside to the Ellis Portal. Although just two minutes prior to the explosion, the crew noted nothing out of the ordinary.

Apart from the reports of these eyewitnesses, the methane detectors recovered from underground offered no evidence of problems prior to the explosion. Three handheld detectors were recovered and examined during the investigation: one located with the victims found at the longwall face; one at a belt drive that powers the coal conveyor belt (known as “the mother drive”) at 102 Break in the North Glory Mains; and one with the victims on the mantrip, who had reached 67 Break in the North Mains. All three devices reported normal readings prior to the explosion and then exceeded measurable maximum readings of carbon monoxide (500 parts per million) and methane (5 percent) at or immediately after the explosion. In addition to these hand-held detectors, none of the equipment-mounted methane monitors recorded elevated methane levels just prior to the explosion. It should also be noted that subsequent testing proved that all of the equipment-mounted methane monitors operated properly at the time of the explosion and there is absolutely no evidence that anyone bridged out, disabled, or otherwise tampered with these devices. These findings (as well as others) are flatly inconsistent with the theory that explosive gases had built up incrementally in the mine.

The explosion occurred at approximately 3:02 p.m., killing nine members on Headgate 22; six members on the longwall; two members near the longwall headgate; four members outby the mule train; one member near the mother drive; and seven members on the mantrip at 67 Break. In
the minutes surrounding the explosion, several events of significance occurred. At 2:59 p.m., the head-side shearer operator activated the emergency stop button (or “e-stop button”) on one of the remote controls for the longwall shearer, which caused the longwall shearer to stop cutting coal. Shortly thereafter, the headgate operator manually cut both power and water to the shearer. Only seconds after 3:02 p.m., the stationary carbon monoxide detector near the mother drive ceased communicating. At that moment, though the shearer was positioned at the tailgate, members of the longwall crew were located far up the longwall toward the headgate; that is, the members of the longwall crew were not where they would be during normal operations. In addition, none had utilized a self-rescuer breathing device. Based on the distance traveled from the time that the e-stop was activated, they appear to have been retreating quickly from the shearer.

The above sequence is completely consistent with a dramatic inundation of gas along the face, to which the longwall crew responded by cutting power to the equipment and quickly retreating from the source of the gas inundation. The time that elapsed between activation of the e-stop button and the explosion was more than sufficient to allow the shearer operator to communicate with the miner at the headgate, and for that man then to shut off the power and water to the longwall, and, finally, for the men near the shearer to travel to the positions on the longwall where they were found after the explosion.

The injuries sustained by other miners also appear consistent with a dramatic inundation of gas. Except for one miner, the exiting miners on the mantrip at 67 Break were overcome by carbon monoxide and none showed any physical trauma or burns. Furthermore, many of the other victims died from carbon monoxide poisoning alone or in combination with other injuries. This indicates a

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2 It would have been standard for the headgate operator to shut off both power and water if the longwall crew sent him instruction to cut the power, because in order for the crew to work on the shearer—typically their response when reporting trouble—water must be turned off or the sprays would interfere with that work.
limited flame front from the explosion and significant decay of momentum effects as it moved through the mine, all of which are characteristic of a gas explosion, rather than a dust-fueled event.

In addition to the above, gas sampling conducted immediately after the accident confirms a dramatic inundation of gas. MSHA took samples of gas emanating from the Bandytown fan beginning at 8:30 p.m. – approximately five and a half hours after the explosion. Between 8:30 p.m. on April 5 and 1:00 a.m. on April 7, the mine liberated approximately 3,000,000 more cubic feet of gas than it would have released under normal operating circumstances according to MSHA data.

Post-Accident Investigation

Within hours of the tragedy, MSHA exercised its authority under federal law to seize control of the mine to permit the rescue and recovery of miners and then the underground investigation of the accident site. After the completion of rescue and recovery efforts, Performance, MSHA, the West Virginia Office of Miners’ Health Safety and Training (“WVOMHST”), and several other entities collectively and independently investigated the cause of the accident. For several weeks in late June 2010, mine rescue teams comprised of representatives of these parties explored the mine to ensure its safety before formal investigation teams travelled underground to begin the critical phase of the accident investigation, which involved the collection, examination and documentation of evidence from the mine.

Performance’s overriding concern always has been to conduct an investigation that accurately identifies the cause of the accident in a manner that is efficient, timely and transparent to all. Accordingly, Performance endeavored to work collaboratively with MSHA to formulate an inspection and evidence collection protocol that would govern the conduct of all parties. In developing its proposals, Performance was guided by common mining industry standards, best practices for explosion and fire investigations, and procedures followed by MSHA in other recent disasters, including the Sago explosion.
Despite Performance’s best efforts, MSHA abused its authority under federal law by preventing Performance from exercising its statutory right and mandate to investigate the cause of the UBB accident. Although MSHA initially had expressed a desire to work cooperatively with Performance to develop the investigation protocol, MSHA unilaterally imposed upon Performance a protocol that contained numerous burdensome restrictions, including prohibitions on: (1) taking or retaining photographs; (2) collecting and preserving mine dust samples; (3) employing well-accepted and commonly used modern mine mapping technology; and (4) participating in or objecting to any destructive testing of materials gathered underground.

MSHA then commenced the underground investigation of the mine over Performance’s objections. With 24 investigation teams flooding the mine in the following months—thus, irrevocably altering the accident site—the availability of evidence and the opportunity to observe conditions in the mine were fleeting, and the enforcement of fair protocols, therefore, of crucial importance. Indeed, MSHA’s alteration, spoliation, or collection of materials without first thoroughly documenting through photography and the most accurate mapping practices potentially deprived Performance and all of those with an interest in securing the most complete and accurate record, of important evidence.

Apart from MSHA’s underground investigation, it conducted many witness interviews. Its chief investigator, Norman Page, has pursued both secretively, excluding the victims’ families, Performance and the public from any meaningful participation. In addition to the restrictions mentioned above, Mr. Page permitted only a single Performance representative to observe MSHA’s investigation teams and even attempted to coerce the company into destroying evidence by applying rock dust or water to areas still under investigation. With respect to formal witness interviews, Mr. Page excluded Performance from the overwhelming majority, allowing company counsel to attend only interviews of witnesses deemed by MSHA to be corporate “control persons.” Mr. Page also
ignored repeated complaints from counsel—on behalf of the company and numerous individuals—that MSHA lured witnesses to interviews under false pretenses, intimidated witnesses with hostile questioning, and denied witnesses an opportunity to review or correct interview transcripts.

In retrospect, the hostility directed at these witnesses presaged Mr. Page’s abuse of Performance’s experts. As explained in greater detail below, Mr. Page knowingly obstructed a search for the truth by repeatedly ordering the withdrawal of Performance’s scientific experts from the mine without a good faith basis; by attempting to intimidate Performance’s experts with retaliatory citations and orders; and by orchestrating a closed-door confrontation of a counsel-retained expert in which Mr. Page unambiguously threatened future retaliatory orders against the expert—in this investigation and any others—in an attempt to influence the expert's work product and opinions.

II. The UBB Explosion was Fueled by an Inundation of Natural Gas.

In the hours and days after the explosion, MSHA captured gas samples from air exhausting from the mine at the Bandytown fan. As discussed in more detail below, a chemical analysis of these samples shows conclusively that the mine experienced a massive inundation of natural gas that was distinct in its composition from ordinary coal bed methane. The introduction of that natural gas into the mine was sudden and rapid, as none of the many items of gas monitoring equipment located throughout the mine detected elevated gas levels in the hours or minutes before the explosion. Moreover, the release was highly pressurized, overcoming the ventilation currents and dispersing the gas widely before ignition. Post-explosion investigation of the mine environment and physical evidence—focusing particularly on evidence of explosive forces and thermal markers—revealed an explosion footprint that is characteristic of a gas explosion and decidedly inconsistent with that of a dust explosion.
A. UBB Experienced a Sudden and Massive Inundation of Explosive Natural Gas on the Afternoon of April 5, 2010.

At 8:30 p.m. on April 5, 2010, approximately five and a half hours after the explosion, MSHA began collecting gas samples from air exiting the mine at the Bandytown exhaust fan. Chemical analysis of those initial samples showed a gas mixture with highly elevated concentrations of combustible gases, principally methane and ethane. At 8:30 p.m., the amount of methane—the only combustible gas for which Performance or MSHA maintained a pre-explosion baseline liberation rate—exiting the mine was approximately 2,300,000 ft³/day, more than double what the baseline liberation rate would have been even with the longwall operating.

Based solely on MSHA’s own sampling data, in the approximately thirty-six hours of sampling before those methane levels dropped back to the pre-explosion baseline liberation rate, more than 3,000,000 ft³ of additional methane above normal exited the mine at the Bandytown fan. That number does not account for the amounts of methane that were combusted in the explosion or that exhausted out of the mine prior to MSHA commencing sampling. In fact, because MSHA did not begin sampling until five and a half hours after the explosion, the true amount of extraordinary flammable gas released in this event was unquestionably far higher than the 3,000,000 ft³ reflected in MSHA’s sampling data. Because the UBB ventilation fans continued to operate throughout the explosion, the mine maintained a constant volumetric flow rate of approximately 400,000 ft³/minute of fresh air. That steady ventilation maintained a “sweep through purge” of post-explosion gases from the mine, allowing analysis and calculation of the gas concentrations for

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3 Inexplicably, MSHA failed to test the gas samples for propane, and – for reasons that defy explanation – subsequently destroyed the samples, precluding further testing or independent analysis.

4 The explosion destroyed ventilation controls and lowered the resistance pressure on the mine’s exhausting fan—as evidenced in the fan charts—which necessarily increased the post-explosion volumetric flow rate. Post-explosion flow, therefore, likely exceeded 400,000 cfm.
the five and a half hour period between the explosion and the beginning of MSHA sampling. Those calculations, including extrapolation of the release, show an estimated peak of approximately 2,800,000 ft³/day of methane exiting the mine, nearly triple the normal liberation rate.

Figure 1: MSHA gas sample data from prior quarters and post-incident

Figure 1 is a graphic representation of the MSHA gas sample data taken at UBB. The Y-axis reflects the daily methane liberation rate in ft³/day. The X-axis reflects time in two different ranges: pre-explosion MSHA quarterly liberation samples (4th Quarter 2009 and 1st Quarter 2010); and post-explosion MSHA gas samples beginning at 8:30 p.m. on April 5, 2010 and extending to April 11, 2010. The graph reflects a very high methane liberation rate of ~2.3 million ft³/day at 8:30 p.m. on April 5. This methane concentration then drops as the ventilation system continues to push
fresh air into the mine. After approximately thirty-six hours the methane liberation rate drops below
the normal working liberation rate for UBB and then continues to drop for several more days before
becoming stable at a non-working liberation rate of \( \sim 500,000 \text{ ft}^3/\text{day} \). The area in red on the graph
therefore represents the approximately 3,000,000 \( \text{ft}^3 \) of inundation gases that MSHA measured
exiting the Bandytown fan in the hours after the explosion.

In the immediate aftermath of the explosion, the source of the inundation gas was unknown.
With UBB’s large sealed areas of previously mined longwall panels, there was initial speculation that
a seal had failed, allowing gas to seep into the actively mined areas. However, all seals were quickly
inspected and ultimately found intact by Massey, MSHA, and WVOMHST, ruling out the sealed
areas as a source of gas. Other hypotheses included methane that accumulated in the longwall gob
area or elsewhere in the mine, but extensive calculations involving known volumes and purge rates
established conclusively that any such accumulation would have been swept completely from the
mine long before MSHA took its first sample at the Bandytown fan. Thus, even before subsequent
analysis of the gas components identified it indisputably as natural gas rather than coal bed methane,
it was clear that the inundation gas must have entered the mine from an external source.

Mine rescue team members, and later investigation team members, encountered a large floor
crack immediately under the longwall shearer that extended approximately thirty-five feet into the
longwall tailgate entry. Months later, investigators discovered additional smaller cracks behind
several of the longwall shields that still were emitting gas. These cracks and/or other similar cracks
that are inaccessible to investigators, are the most likely source for the inundation gas. Indeed, the
large crack underneath the longwall shearer initially had distinct pressure doming effects and it was
blown clean of dust or debris, all of which indicates a pressurized release from that crack.
Furthermore, ground-penetrating radar analysis of that crack confirmed that it extends down at least
ten feet and that there are large voids in the bedrock below the crack.
Figure 2: Depiction of longwall tail and location of floor cracks

Figure 3: Photo of the large floor crack in the longwall tailgate entry
While it is impossible to determine for certain that the cracks were the source of the inundation, there can be no doubt, based upon objective analysis of the data, that the explosion was immediately preceded by a massive inundation of flammable gas from an external source. Those analyses established beyond doubt that UBB was inundated by natural gas rather than coal bed methane. Coal bed methane, which is liberated from the coal itself or from the rocks above or below the coal seam, has distinct regional compositions, which furnish a chemical “fingerprint.” In the region in which the UBB mine is situated, coal bed methane is composed of 99.9% pure methane, with only trace levels of other hydrocarbons. Natural gas, by contrast, is found deep underground in highly pressurized reservoirs trapped by impermeable rock layers. Natural gas is a more mature gas than coal bed methane, and typically contains other gaseous hydrocarbons, most prominently ethane and propane. Analysis of the post-explosion gas samples MSHA took at the Bandytown fan and of gas samples taken directly from floor cracks behind Shields #160, #170, and #171 on the UBB longwall face in the months after the explosion shows that the gas from both of those sources was composed of approximately 91% methane and 6% ethane. The gas from behind Shields #160, #170, and #171 also contained approximately 3% propane.\(^5\) In stark contrast, coal bed methane gas samples taken from a core sample drilled at UBB down through the various coal seams shows that each of those seams liberates coal bed methane that is composed of greater than 99.9% pure methane, with only trace if any levels of ethane or propane. Thus, the inundation gas at UBB was natural gas, not coal bed methane.

\(^5\) Again, MSHA did not test for propane in its Bandytown fan gas samples and destroyed those samples before they could be tested for propane.
The graphs in Figure 4 above plot the ethane to methane ratios of gases collected from different sources at UBB. The red bars represent five samples collected from the floor cracks behind Shields #160, #170, and #171 on the UBB longwall face between July 23, 2010 and December 9, 2010. The green bars represent samples taken from four different natural gas wells located on Performance Coal property at UBB. The purple bars represent three of the gas samples MSHA took at the Bandytown fan: one from 8:30 p.m. on April 5, 2010; one from 3:00 a.m. on April 6, 2010; and one from May 29, 2010. Finally, the blue bars represent six samples of coal bed methane from various coal seams in a core sample drilled at UBB. As the graph shows clearly, the ethane to methane ratios of the natural gas from the initial Bandytown fan samples and from the floor cracks behind the longwall shields are virtually identical both to one another and to the natural gas from the gas wells on the property. They also are distinctly different from the low ethane to methane ratios of coal bed methane.
methane ratio of the nearly pure methane in the coal bed methane samples. In fact, the ethane to methane ratios of the three natural gas sources are two orders of magnitude (or 100 times) higher than that of the coal bed methane samples, as the graph is plotted on a logarithmic scale. The graph also shows that, as time passed, the inundation natural gas in the Bandytown fan samples started to decrease such that the overall gas mixture in the exhaust air began to trend back towards a ratio more characteristic of coal bed methane, which is what the mine normally would have exhausted absent the inundation of external natural gas. By November 2010, the release of natural gas into the mine had subsided to such small amounts that the trace ethane levels were virtually undetectable in the exhaust air, indicating the mine had returned to exhausting essentially pure coal bed methane once again.

Though most investigators now acknowledge the introduction of some natural gas into UBB on April 5, 2010, some initially suggested that ethane may have been present in the MSHA gas samples from the Bandytown fan as a product of combustion rather than as a component of an inundating natural gas. This suggestion is easily disproved by comparing the rates at which the fuel gas components—methane and ethane—exhausted from the mine against the rate at which the products of combustion—carbon monoxide, hydrogen, ethylene, and acetylene—exhausted from the mine.
Figure 5: Comparative decay rates from MSHA gas sample data

As the graph in Figure 5 shows, the methane and ethane decayed at the same rate, proving they are two components of the same fuel gas. Moreover, the ethane decayed at a markedly different rate from the products of combustion, showing that it was not present in the samples as a product of combustion. Finally, the decay rate for the methane and ethane reflects a continuing input source, showing that there was a sustained leak of natural gas into the mine that continued for several days after the explosion.

The inundation of natural gas into UBB was not only massive, but it also was sudden and rapid. Data collected from stationary methane monitors and personal handheld methane detectors shows that there was no abnormal methane in any of the three working sections in the affected area of the mine up to only minutes before the explosion, and also shows that extremely high levels of
both methane and carbon monoxide flooded the entire affected area within moments after the explosion.\(^6\)

1. 8:30 Longwall cuts out on tail – no CH\(_4\)  
2. 11:30 Longwall Coordinator at longwall tail – no CH\(_4\)  
3. 2:15 Foreman travels Tailgate 21 – no CH\(_4\)  
4. 2:38 Pre-shift TG22 report called out – no CH\(_4\)  
5. 2:40 Pre-shift longwall report called out – no CH\(_4\)  
6. 2:55 Pre-shift HG22 report called out – no CH\(_4\)  
7. 3:02 Explosion

A. Handheld Detector detects maximum CO/CH\(_4\)  
B. Handheld detector detects maximum CO/CH\(_4\)  
C. Handheld detector detects maximum CO/CH\(_4\)  
D. Victim exposed to significant CH\(_4\)

Figure 6: April 5, 2010 UBB gas data chronology (times approximate)

The data charted on the map in Figure 6 shows the absence of flammable gas in the mine up until a few minutes before the explosion. At 8:30 a.m., the longwall shearer completed its first pass of the day and cut out at the tailgate. The crew operating the shearer detected no abnormal methane at that time, nor did they encounter any unusual floor cracking or fracturing. This is a critical initial data point, in that it dispels any suggestion that cracking or gas accumulation occurred in that location while the longwall was idle the previous day (Easter Sunday). Several hours later, at

\(^6\) Appendix A provides a detailed discussion and analysis of the different stationary and personal gas detection equipment in use at UBB on April 5, 2010.
approximately 11:30 a.m., Performance’s Longwall Coordinator traveled to the longwall tailgate, where he, too, encountered no elevated methane or unusual floor cracking.

In the roughly twenty-five minutes prior to the explosion, the day shift crews in the three working sections in the affected area began to call out their pre-shift examination reports for the oncoming evening shifts. At 2:38 p.m., victim Steve Harrah called out his pre-shift report for the Tailgate 22 section, reporting zero methane and no other hazards. At 2:40 p.m., victim Rick Lane called out his pre-shift report for the longwall—an examination that would have included the entire length of the longwall face, head to tail—and also reported zero methane and no floor cracking or other hazards. Finally, victim Dean Jones called out his pre-shift report from the Headgate 22 section at 2:55 p.m., just minutes before the explosion, and reported no unusual methane or other hazards. These important data points, taken by experienced and professional miners using state of the art monitoring equipment, show conclusively that flammable gas did not build up or accumulate gradually in UBB, but rather flooded the mine suddenly just prior to the explosion.

Data from personal handheld methane detectors also provides critical information on how widely and rapidly the fuel gas dispersed through the affected area of the mine at the time of the explosion. Within moments, Rick Lane’s Solaris methane detector on the longwall face (Point A on Figure 6) exceeded its maximum recordable readings of both methane and carbon monoxide. The same is true for victim Mike Elswick’s detector (Point B on Figure 6), which was recovered near the longwall conveyor belt mother drive in the North Glory Mains area, approximately 3,700 feet from the crack at the longwall tailgate. Survivor James Woods’ Solaris detector (Point C on Figure 6) also registered maximum recordable readings of both methane and carbon monoxide all the way out at the mantrip located at 67 Break, approximately 6,800 feet from the longwall tailgate. Finally, at least one of the victims on the Headgate 22 section (Point D on Figure 6), approximately 6,000 feet from the longwall tailgate, had significant methane levels in his body on autopsy. Together, these data
points establish that the inundating natural gas reached the outermost points of the entire affected area of the mine during the course of the explosion. This occurred both due to dispersion of the incoming gas prior to ignition, as well as through displacement of unburned gas-air mixture into these areas in the course of the explosion. The expansion ratio for a stoichiometric\(^7\) methane-air mixture is approximately seven times, and an abundance of fuel in “fuel-rich” zones would mix with air in the portions of the mine that the flammable cloud had not reached before ignition. That such vast quantities of natural gas—which is more easily ignitable and combustible than coal dust—was present in all locations within the affected area of the mine at the time of the explosion is by itself compelling evidence that the gas was the fuel for the explosion.

**B. The Explosion Footprint—Primarily its Forces and Thermal Markers—Is Indicative of a Relatively Limited Gas Explosion, and Is Inconsistent With the Characteristic Footprint of a Dust Explosion.**

An explosion’s propagating blast wave transfers kinetic energy in its direction of travel and the explosion’s combustion process transfers thermal energy to objects through conduction or radiation, leaving characteristic forces and thermal markers. (Strehlow & Baker, 1976). Like the composition of the gas, different types of explosions leave “fingerprints,” which can be identified objectively. Massey retained a team of leading world-renowned fire and explosion experts to analyze those markers and the critical evidence they provide as to the fuel source, point of origin, and other important characteristics of the UBB explosion.\(^8\) Those analyses point unequivocally to gas, and reject coal dust, as the fuel for the explosion.

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\(^7\) A stoichiometric mixture is one in which the components are in the exact proportions that are optimal for the given reaction, here combustion.

\(^8\) Curricula Vitae for several of the lead fire and explosion experts are attached as Appendix B.
1. **The Observed Overpressures from the UBB Explosion Show a Relatively Limited Gas Explosion and Are Inconsistent With a Widespread, Propagating Coal Dust Explosion.**

   After rigorous and methodical examination by fire and explosion experts and highly-specialized structural engineers with expertise in gas explosions and coal dust explosions, Massey’s team of experts determined that the maximum overpressure generated anywhere in UBB by the explosion was 10 pounds per square inch (“psi”), with the overwhelming majority of the affected area experiencing overpressures far less than 10 psi, most on the order of only 2 or 3 psi.⁹ For the reasons discussed below, that overpressure evidence is inconsistent with a propagating coal dust explosion.

   Explosion effects can be characterized as either primary or secondary; primary effects are those attributable directly to the impact of the pressure wave on structures or people, while secondary effects are those caused by something other than the initial pressure wave, such as blast wind or projectiles. The primary effects of blast waves on structures and people have been well studied, and that body of research is helpful in evaluating the overpressures of an explosion based on observed primary blast effects.

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⁹ The term “overpressure” simply means pressure in excess of normal atmospheric pressure.
Figure 7 provides baseline blast wave effects on certain objects at specific overpressures. This information was useful in assessing the overpressures associated with the UBB explosion. For example, unbroken glass on equipment gauges or even light bulbs was indicative of low localized overpressures. Wooden prop setter poles in the mine, which are structurally similar to utility poles, were largely intact, suggesting that local overpressures in those locations were below 5 psi. One of the most prevalent, and thus important, sources of overpressure data at UBB was the concrete ventilation stoppings. Concrete and cinder blocks are among the most well-studied materials in terms of their exposure to blast effects and, as shown in Figure 7, concrete and cinder block walls will shatter at between 2 and 3 psi. The ventilation stoppings at UBB, constructed of unreinforced concrete or cinder blocks, were blown out but not shattered in virtually all locations within the affected zone. An analysis was performed to determine the blast forces required to throw the blocks

<table>
<thead>
<tr>
<th>Overpressure (psi)</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02</td>
<td>Noise (137 dB)</td>
</tr>
<tr>
<td>0.15</td>
<td>Glass Breakage</td>
</tr>
<tr>
<td>0.5-1.0</td>
<td>Glass/window shattering</td>
</tr>
<tr>
<td>2-3</td>
<td>Concrete and cinder block walls shatter</td>
</tr>
<tr>
<td>5</td>
<td>Wooden utility poles snap</td>
</tr>
</tbody>
</table>

Figure 7: Established baseline blast effects on relevant objects.
the observed distances. The calculated explosion overpressures were less than 3 psi in most of the mine.

Similarly, the roof bolt pans on the roofs of the mine entries throughout the affected area provide valuable overpressure evidence. While showing signs of exposure to directional forces, the UBB roof bolt pans did not show any evidence of “tuliping” under high localized pressures like the roof pans at the Sago Mine did after the 2006 explosion there, and indeed at UBB the roof pan damage generally was indicative of overpressure below 2 or 3 psi. The limited structural damage at UBB—while certainly impressive to the layperson’s eye—provides compelling evidence to trained experts that the overpressures from the UBB explosion were for the most part well below 3 psi, and the maximum determined in isolated spots was still only between 8 to 10 psi.

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10 Primary effects of an explosion pressure wave on human beings is similarly well-studied. One such effect is that notable eardrum damage will occur at approximately 2 or 3 psi, with the lower threshold for full eardrum rupture occurring at 2.4 psi. (Pape, Mniszewski, Longinow & Kenner, 2010). Based on the limited autopsy information to which Massey has been given access to date, none of the victims experienced primary blast effects sufficient to cause notable eardrum damage.
Figure 8: Map of UBB explosion overpressures

The relatively low observed overpressures at UBB provide invaluable and incontrovertible evidence about the fuel source for the explosion. Explosion overpressures are largely a function of fuel concentration and obstructions, and numerous tests have demonstrated that combustion rate and blast pressure can increase to high levels in tunnels, pipes and similar geometries in which combustion progresses predominately in one dimension (i.e., axially down the tunnel). The extent of a gas/vapor cloud explosion is governed by the region of gas that falls within its upper flammable limit ("UFL") and lower flammable limit ("LFL"). Gases in concentrations that lie outside of their flammable range will not combust, though a “rich” mixture can be easily diluted to concentrations within the flammable range and thus ignite. The upper and lower flammability limits for natural gas depend on the exact mixture of the particular natural gas, though the approximate range mirrors that of methane (its largest constituent) with a lower flammability limit of \(~5\%\) and an upper
flammability limit of ~15% (Bjerketvedt, Bakke, & van Wingerden, 1997). At UBB, several factors kept the explosion overpressures relatively low, including: (1) the flammable portion of the fuel-rich natural gas cloud was only at the outer fringe of the cloud as it mixed with air; (2) noncombustible solids—principally rock dust—slowed combustion of the gas; and (3) a large volume of the mine did not participate in the explosion, allowing expansion of the blast pressure (including venting out the fan shaft, portals, and other openings).

Importantly, extensive expert modeling of the combustion of a fuel-rich gas/air mixture in the geometry of the UBB mine yields overpressures consistent with those observed at UBB. Computer-aided computational fluid dynamics dispersion models that simulated the natural gas inundation rate, the mine configuration, and the prevailing ventilation system calculated that sufficient natural gas to cause the thermal and blast damage identified underground would have been released into the mine within 1-2 minutes. Modeling of the combustion of that fuel-rich vapor cloud in the basic UBB mine geometry using the FLACS CFD modeling package produced effects consistent with the relatively low overpressures reflected in Figure 8.

Unlike a gas explosion, dust explosions require initial pressures to lift and suspend the dust in order for it to participate in the explosion. Of vital importance to the propagation of a coal dust explosion is that the initial explosion, whatever the cause, must be sufficient to lift the dust in sufficient quantities in order for the reaction to continue. Extensive research has been done on dust lifting (Fedorov, Fedorova, Fedorchenko, & Fomin, 2002), (Kosinski, Christian Hoffmann, & Klemens, 2005), (Gerrard, 1963), (Witt & Carey, 2002). Significantly, that research shows that the pressures required to generate dust lifting in experimental conditions are relatively high, as are the shockwave velocities. Even in tests with a 450 m/s shockwave, dust above the minimum explosive
concentration ("MEC") was only lifted ~8cm from the deposit surface (Zydak & Klemens, 2007). In full scale testing, where the explosion was initiated by a slug of methane and the ensuing dust explosion was able to propagate, the overpressures were significant enough that pressure transducers and other equipment were destroyed and the observed pressures at the exit exceeded 5 bar (or 72.5 psi) (Fischer, 1957). Examinations of the dust lifting process detailed in the scientific literature all reflect pressures exceeding 1 bar (14.5 psi). The lowest observed peak overpressure that was identified in the literature for a small scale dust explosion (<500 ft) exceeded 20 psi. (Richmond, 1979). Moreover, as these explosions propagated, the pressures increased dramatically. At UBB, the observed and documented overpressures were far below those that this literature indicates would have been required to lift and sustain a propagating dust explosion. The observed overpressures, therefore, are inconsistent with coal dust as a feasible fuel for the explosion.12

2. The Observed Flame Front and Heating Zones Reflect a Relatively Contained Gas Explosion, Not a Widespread Dust Explosion.

As referenced above, the computer models simulating combustion of the fuel-rich gas cloud formed by the natural gas inundation at UBB are consistent with the physical evidence underground indicating that much of the heating damage in the affected area is attributable to hot gases and not directly to flames. Indeed, the UBB explosion had a fairly limited flame front and sporadic heating zones, which is indicative of rich gas cloud combustion that only sporadically mixes with enough air to reenter the flammable range and resume combustion, reviving the flame front and causing increased heating damage.

11 Moisture plays a key role in the ability of dust to be lifted. Research has demonstrated that above approximately 9% moisture content dust will not be lifted regardless of the velocity within the tested range (8-13 m/s). (Smitham, 1991). Below this level the quantity of dust lifted is highly dependent on the particle size and moisture content. This is significant because large areas of the UBB mine dust were wet.

12 Appendix C provides a comparison of the combustion processes and other characteristics of flammable gas explosions versus coal dust explosions.
By contrast, the flame front and heating evidence at UBB is inconsistent with a propagating coal dust explosion. Once a coal dust explosion exceeds the minimum explosive concentration ("MEC") of approximately 50 g/m³, it will combust continuously, not sporadically. In fact, unlike a gas explosion, a coal dust explosion will only continue to propagate if the coal dust continues to burn. Therefore, the sporadic zones of flame and heating at UBB could not have been caused by a propagating coal dust explosion as such an explosion would have extinguished at the first gap.

The observed flame front and heating at UBB is particularly inconsistent with the "massive" coal dust explosion MSHA has postulated. MSHA’s post-explosion dust samples—the invalidity of which is addressed separately in Section IV below—incorrectly suggest combustible coal dust fuel was present over the entire area inby 78 Break, as reflected on the map in Figure 9 below. Simultaneously, however, MSHA’s post-explosion coke test samples incorrectly suggest flame front over the entire affected zone and all the way out to 78 Break, as reflected on the map in Figure 9 below. That MSHA-proposed scenario is impossible for at least the following reasons: (1) Coincidental overlap between available fuel and extent of flame front is physically impossible, as it would not account for explosion expansion; (2) If there were a propagating coal dust explosion with available fuel and a flame front all the way out to 78 Break, there would have been far more significant explosion effects outby that point than the contemporaneous data reflects; and (3) There is nothing at UBB even resembling the level of destruction and effects that would have been associated with a coal dust explosion involving a fuel source and flame front similar to MSHA’s post-explosion dust and coking maps.
Figure 9: MSHA post-explosion rock dust sample map (red = non-compliant)

Figure 10: MSHA coke test map (red = x-large; orange = large; green = small; blue = trace)
According to the MSHA maps in Figures 9 and 10 above, the extent of flame inferred from the coking data either matches or was contained within the zone MSHA claims was inadequately rock dusted prior to the explosion. Thus, according to MSHA, the area through which flame propagated either coincided with, or was actually smaller than, the area it claims contained an explosive dust mixture that was inadequately rock dusted. As any explosion expert well knows, such a scenario is impossible. MSHA is postulating an explosion without expansion of the flame generated by the explosion, which simply could not happen. Without expansion, there can be no explosion.

An explosion is driven by a flame front that generates a high temperature fireball behind it as it propagates into the unburned mixture that is initially at ambient temperature. The ratio of the volume of the high temperature, burned combustion products to the volume of the room temperature, unburned reactant is the expansion ratio. It is given by the ratio of the burned-product temperature within the fireball to the unburned-reactant temperature into which the flame propagates. It is the rapid flame propagation and the expansion of the hot fireball gases behind the flame front that generates the explosion and the resultant pressure forces. Absent expansion, there is no explosion. It would be physically impossible for the explosion to have been confined to only the volume of the unburned, non-compliant dust region that MSHA believes provided the fuel for the explosion.

The supposedly non-compliant dust mine volume that MSHA measured in its post-explosion sampling was approximately 46 million cubic feet. The volume of the entire mine out to the Ellis Portal (excluding the gob volume of the #21 longwall panel) is approximately 67 million cubic feet. That 46 million cubic feet of a flammable dust cloud, if exploded with an expansion ratio of only 3.2, would expand to a flame volume of 147 million cubic feet, which substantially exceeds the UBB mine volume. Thus, if indeed as MSHA contends, that volume of non-compliant post-
explosion dust samples had been the fuel for the explosion, flame and pressure forces would have completely engulfed the entire mine out to the Ellis Portal and beyond. The fact that such a flame and pressure force extent was not observed\(^{13}\) directly contradicts the MSHA contention that the explosion was a dust explosion fueled by the non-compliant rock dust zone it identified in post-explosion sampling.

3. **The Thermal Damage to Evidence in the Affected Areas Shows a Clean and Relatively Thin Gas Flame Front, and that Evidence Shows No Sign of Exposure to Combusting Coal Dust.**

Physical evidence recovered from the mine after the explosion furnishes a valuable resource from which to determine the characteristics of the explosion. The transfer of energy to an object causes physical and chemical damage and, depending on the way energy is released during the explosion, typically causes three different types of damage: (1) thermal damage from the flame front and the trailing hot gases; (2) structural damage from the overpressure wave or the impact of objects carried by the explosion force; and (3) particulate frictional damage from the impact and friction of particulate material suspended in the explosion air flow.

Thermal energy is transferred in three ways: by conduction, convection, and radiation. Combustion-related heat damage from gases and flames is normally caused by radiation and convection, though flame impingement can cause heat to be transferred to an object by conduction. Radiative heat transfer in an explosion occurs both between the propagating flame front and any object in its proximity, and between the hot and sooty gaseous combustion products and any object in their proximity. Convective heat transfer occurs between the gas-phase combustion products and any object in their path.

\(^{13}\) For example, the mantrip located at 67 Break in the North Mains was neither burned nor damaged by the explosion. Indeed, two miners from that mantrip survived the explosion. This indicates both that the flame front did not reach that location and that the explosion’s momentum effects were significantly diminished by that point.
Comparing evidence recovered from UBB with similar objects tested in controlled laboratory conditions provides an estimate of the incident heat fluxes. By applying established values reported in the scientific literature to the order of magnitude of the heat flux that damaged a particular item of evidence, Massey’s experts were able to obtain relevant flame temperatures and flame and flow velocities. All of that information provides valuable insight into the nature of the explosion’s fuel. A coal dust explosion has a significantly thicker reaction zone than does a gas explosion, and generally also has a higher effective heat of combustion. Coal dust combustion also leaves characteristic markers—such as dust splatter or damage from embedding combusting coal dust particles—that was notably absent from any of the evidence collected at UBB. Analysis of the thermal damage to objects in the affected area of UBB strongly indicates the damage was caused by a gas explosion and not by a coal dust explosion.
Figure 11 shows paper bags of concrete located on the Headgate 22 section, an area that experienced relatively significant explosion effects. Fixed objects like these heavy concrete bags are preferable evidence of the explosion’s thermal markers because they did not move from their original location during the explosion turbulence. The bag in Figure 11 shows light charring in one spot, but is otherwise largely unburned. Most importantly, the layer of dry coal dust coating the bag from the explosion clearly was not combusting when it came into contact with the bag, because none of the dust particles smoldered or imbedded into the paper bag.
Figure 12: Plastic speaker cover from a control unit on the longwall face

The plastic on the longwall speaker cover in Figure 12 was melted by a clean heat source, a tell-tale sign of gas heating. Had this plastic been melted by combusting coal dust, that heat transfer mechanism necessarily would have left burning coal dust particles imbedded into the molten plastic. Though a small amount of dry dust settled on the plastic from the explosion turbulence, it is obvious that no combusting dust particles imbedded into the plastic whatsoever.
The yellow plastic light cover in Figure 13 was melted from the explosion’s heat, and the melted plastic is stretched in one direction from directional explosion winds. The coal dust that covered the plastic surface from the explosion turbulence is dry and easily brushed off; there is no evidence of any combusting coal dust particles imbedded into the molten plastic. Moreover, the glass light bulbs are completely undamaged, indicating very low overpressures that are inconsistent with a coal dust explosion having propagated to the mouth of Headgate 22.
Figure 14: SEM scan of UBB mine dust from Tailgate 21

Scanning electron microscope (SEM) images of the mine dust itself, like those in Figure 14, show that, while mine dust was exposed to heating and did thermally degrade somewhat, there is no indication of significant coal dust combustion or that coal dust contributed materially to the explosion’s energy. For example, in the scan shown at Figure 14, most of the coal dust particle is unheated and untouched by the explosion. To the extent the scan shows any thermal insult to the coal dust, it shows relatively minor heating on only one small corner of the otherwise untouched
coal dust particle. These scans are inconsistent with a coal dust explosion, and further support the conclusion that the UBB explosion was not fueled by coal dust.

Finally, that conclusion is consistent with similar natural gas inundations at UBB and at other mines in the immediate vicinity both before and after the April 5, 2010 UBB explosion. On July 3, 2003, UBB suffered a natural gas inundation on Longwall Panel 16. Ultimately, both Massey and MSHA concluded that the cause was a high-pressure “burst” of flammable gas into the mine through a large crack in the floor at about the mid-point of the longwall face. Indeed, witnesses reported that the gas entered the mine with such force that it sounded like a jet engine.

Subsequently, on February 18, 2004, there was another inundation of flammable gas into UBB, this time on Longwall Panel 17. Again, as with the 2003 outburst, both Massey and MSHA concluded that the gas entered the mine in a high-pressure release through a large crack in the floor along the longwall face. Indeed, in a March 4, 2004 memorandum regarding the 2003 and 2004 UBB “floor bursts,” MSHA concluded that “the source of gas is more likely to be a pressurized geological reservoir, rather than bleed-off from a coal seam” and specifically that it likely was “[n]atural gas” trapped in structural highs beneath the Lower Eagle seam. That same report noted that “the Harris Mine, also in the Eagle seam adjacent to the Upper Big Branch Mine, has experienced similar floor bursts.”

Furthermore, since the UBB explosion on April 5, 2010, another neighboring longwall mine in the Eagle seam—Speed Mining’s American Eagle Mine—reportedly has experienced multiple sudden outbursts of flammable gas from cracks in the mine floor as the longwall was retreating. As with the previous UBB outbursts, these high pressure releases necessitated idling the mine until the flow of gas subsided and the inundating gases were carried out of the mine by its ventilation system. Both MSHA and WVOMHST have studied the post-UBB outbursts at the American Eagle Mine,
and ultimately allowed the mine to continue operating with increased airflow, including belt air, to ventilate the longwall face.

The natural gas inundation that fueled the UBB explosion was, therefore, consistent both with prior outbursts at UBB and other nearby mines and with subsequent outbursts at a nearby mine. Failure or refusal to acknowledge that fuel source or its mode of entry in the mine only hampers the honest effort to protect miners from a future reoccurrence.

III. The Explosion Likely Originated in the Tailgate 21 Entries. Though It Is Unlikely the Precise Ignition Source Ever Will Be Determined With Any Certainty, the Explosion Was Not Caused by Faulty Shearer Maintenance.

As a complex industrial explosion makes its way from its point of origin, it leaves countless markers that reveal where the explosion originated and how it propagated. Clues gleaned from the sheer physical force of the blast—for example, damage to a stopping—reveal the direction and magnitude of the overpressure; additionally, heat generated by combustion—for example, melted plastic—provide important additional information about the source and direction of the blast. The UBB explosion is no exception. Experts in fire and explosion dynamics and highly-specialized structural engineers devoted more than a thousand hours conducting underground examinations at UBB, and have extensively studied the thousands of photographs taken underground. Through these efforts, the experts have gathered sufficient data to retrace the path of the UBB explosion. They have concluded that although the precise ignition source may never be determined, the explosion likely originated in the Tailgate 21 entries, but certainly not as the result of faulty shearer maintenance.14

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14 The geometry of the UBB mine and the ventilation system created by stoppings and overcasts in the area inby 78 Break provided for an added degree of complexity in analyzing damage patterns.
A. The UBB Explosion Likely Originated in Tailgate 21.

1. Indicia of Overpressure at UBB

A propagating blast wave, such as the one at UBB, transfers kinetic energy in its direction of travel and, if strong enough, will cause damage to objects in its path. The most significant damage is likely caused by the direction of the wave of propagation (as compared to any reverberations of the wave). Therefore, as the explosion wave moves through the mine it leaves evidence in its wake that identifies the direction it travelled. The direction of the overpressure waves can then be used to identify and isolate their potential origin.

The direction travelled by the overpressure waves at UBB was determined through careful examination of the damage to stoppings, roof pans, equipment, and other objects in the mine. During this phase of the investigation, evidence of force, and the direction of that force, on these objects was carefully examined and charted. For example, Figure 15 is a photograph taken of a roof pan at UBB in Headgate 21 near 23 Break. The damage to the roof pan indicates that the force moved from right to left, causing the corner of the roof pan to fold.
Similarly, the stopping in Figure 16, located in Tailgate 21 between 35 and 40 Breaks, is also an indicator of force. From the location of the loose blocks and other debris, the primary force moved from back to front. The extent of the damage to a particular stopping is also illuminating. Areas of combustion, i.e., the explosion source zone, are identified by the evidence of thermal effects, directional indicators showing pressure generation within the zones, and blast damage that is consistent with blast waves. Combustion generates blast pressures, which can be used to distinguish explosion sources from other areas. Blast pressure decays with distance away from explosion source zones, and reduced damage is therefore an indication of a zone that was outside of an explosion source zone.

Careful inspection of this photograph also reveals consistent force indicia on the roof pans near the stopping.
Figures 15 and 16 are but two of the thousands of indicators of the pathway of the explosion at UBB. When aggregated, these individual data points create a narrative of how the explosion propagated through UBB. Performance meticulously compiled the results of this comprehensive analysis of the force indicators in the mine. Figure 17 represents a sample of the analysis of the force indicators. The numerous arrows in Figure 17 represent the amount of force and the direction of that force on objects throughout the UBB accident site. This information can then be used to determine the path of the explosion and to develop sophisticated computer models that can be used to test any hypotheses against other known data points.
Figure 17: Map depicting indicia of force and direction throughout accident site
Headgate 22 serves as a good illustration of the utility of this data. As indicated in Figure 17, the stoppings in the first eleven breaks of Headgate 22 were all blown north, towards the No. 3 Entry. From this evidence, and from other indicia of force, experts were able to determine that for the first eleven breaks of Headgate 22 the blast travelled west in the No. 1 Entry towards the working face. As the overpressure wave made its way through the No. 1 Entry it also spread up each break, knocking out stoppings in the process.

2. Explosion Pathway at UBB

The trajectory of the explosion at UBB is most useful for determining where the blast did not originate and, as a result, isolates those areas of the mine in which the blast could have originated.\(^\text{16}\) For example, the examination of force and thermal damage indicates that the longwall was not the origin of the explosion. The longwall section has two sets of damage from force, both the result of relatively low overpressure. First, the area of the longwall near the tailgate, including Shield #176 and the tail drive, show explosion effects that indicate force coming from the Tailgate 21 entries.\(^\text{17}\) Second, a force that came down the longwall from the headgate entries appears to have been from the final blow down phase of the mine, after the initial pressure rise. Thermal damage was noticeably absent along much of the longwall. A number of thermally sensitive items had little, if any, thermal damage, including paper, insulation on electrical cables, and plastic labeling on electrical boxes. The force and thermal damage on the longwall (or lack thereof) is not indicative of the force path or the heat footprint of an ignition. It is, however, consistent with a significant

\(^\text{16}\) Appendix D describes in detail the particular evidence of the overpressure in different sections in the mine inby 78 Break and discusses why those areas were determined not to be points of origin.

\(^\text{17}\) Prop setter butts embedded in the top of Shield #176 are indicative of a force coming from the direction of Tailgate 21. Similarly, a cover plate from the tail drive near the tailgate entry of the longwall was flung up the longwall over a hundred feet.
inundation of natural gas that caused the face of the longwall to be above UFL during the explosion and therefore unable to support combustion.

The evidence underground is most consistent with a scenario involving an explosion originating in Tailgate 21, which sent an overpressure wave towards 21 Crossover and the outby sections (e.g., Old North Parallel Mains). From 21 Crossover the wave would have travelled into the North Glory Mains, where it split and went outby towards Parallel Mains and inby towards North Jarrells Mains, the Glory Hole, and Headgate 22 sections. From 21 Crossover the wave would have also passed into Headgate 21, where it headed west towards Tailgate 22, 22 Crossover (and then to Headgate 22), and to the longwall bleeder section and the Bandytown fan. The initial blast would have sent a wave travelling towards the longwall face and would be consistent with the damage in the tailgate area of the longwall, described above. This pathway is consistent with all the damage patterns encountered in the mine sections affected by the blast and fully consistent with computer modeling that takes into account all known data about the explosion.18

B. The Ignition Source Has Not Been Determined; However It Is Not Likely To Have Been The Longwall Shearer.

Since Tailgate 21 has been identified as the likely point of origin, it stands to reason that the ignition source was somewhere in that area of the mine. Yet despite isolating Tailgate 21 and Headgate 21 as the most likely potential points of origin and despite being a point of emphasis for investigators from MSHA, WVOMHST, and Performance, the ignition source of the UBB explosion has not been positively identified. This is not uncommon for a complex, industrial

18 A much less likely and more complex scenario is an explosion originating in Headgate 21. This scenario involves the passage of two overpressure waves through Headgate 21. If the explosion originated at Headgate 21, the initial explosion would have propagated an overpressure wave west towards the Longwall Bleeder Section, Tailgate 22, 22 Crossover and Headgate 22, as well as east towards the North Glory Mains and outby. That same blast wave would have travelled south through the longwall face and then would have ignited a stronger explosion in Tailgate 21 which would have followed the same pathways as discussed in the more likely scenario.
Moreover, it is important to bear in mind that in situations involving a sudden and massive inundation of natural gas, the ignition source could have been quite small—indeed, due to the flammability of natural gas, the ignition could have been caused by static electricity. While this fact vastly complicates the task of identifying an ignition source, and suggests that the source of the UBB explosion may never be identified positively, it also underscores the fallacy of focusing excessively on major equipment flaws, such as the longwall shearer, as the possible source. Indeed, the results of the underground investigation have, among other things, excluded certain potential sources.

As discussed above and consistent with a massive inundation of natural gas near the longwall, the longwall section is an unlikely source of the ignition due to (1) the lack of force indicators and thermal damage in the longwall area; (2) the pathways the explosion travelled through the mine; and (3) the likelihood that the environment was above UFL during the explosion and, therefore, unable to support combustion. Moreover, the deceased miners that were found on the longwall did not suffer any burns, further indication that an ignition occurred elsewhere.

In the days, weeks, and months following the April 5, 2010 explosion and before a meaningful investigation could take place, it was hypothesized that the source of the ignition was the shearer of the longwall. This was an understandable assumption at the time, primarily because the shearer, in normal operation, has a tendency to emit sparks. This is especially true when, as at UBB, the coal bed was bordered by sandstone. Yet while the longwall shearer cannot be ruled out conclusively as an ignition source, now, after an opportunity to inspect the shearer and the surrounding area, it is an unlikely ignition source for a number of discrete reasons.

\[19\] For example, the ignition source of the Jim Walter Resources #5 mine accident that killed 13 miners in Brookwood, Alabama on September 23, 2001 was never determined despite an exhaustive investigation. See Secretary of Labor v. Jim Walter Resources, 27 FMSHRC 757, 2005 WL 3114590 (Nov. 1, 2005).
Most significantly, the shearer will only create sparks while it is in operation. The sparks that could potentially cause an ignition are created by friction as the shearer revolves into the coal bed and surrounding rock. If the shearer is stationary it necessarily cannot create those sparks. On April 5, 2010, the longwall at UBB, and by extension the shearer, was manually shut down at approximately 2:59 p.m., more than two minutes before the 3:02 p.m. explosion. The shearer, therefore, could not have been emitting sparks at the time of the explosion.

MSHA has nevertheless thrust maintenance of the longwall shearer at UBB into the spotlight by asserting that the state of the cutting bits and water sprays on the shearer at the time of the accident increased the likelihood of sparking. Not only is this premise flawed, but it is belied by the evidence. The longwall shearer, as it cut through coal and sandstone near the tailgate entry, would have been emitting sparks regardless of the wear on the bits and there is no evidence to suggest that the normal wear on the bits would cause it to spark any more during the mining process. As for the water sprays on the shearer, they were designed for dust suppression only and there is no factual or academic support for the suggestion that a full set of functioning water sprays would be able to extinguish a gas ignition. The water sprays on the shearer, much like the cutting bits, were regularly replaced by the longwall crew at the end of a pass or during other maintenance. The few missing or clogged water sprays on the are most likely the result of either the last pass on the longwall prior to the accident or, more likely, the natural corrosion over time in the months-long interval between the accident and their inspection. Moreover, if any water sprays were knocked out during the most recent pass, subsequent controlled testing suggests that it likely would have caused more water to enter the environment, not less.

Evidence also shows that the cutting bits and sprays on the longwall shearer were well maintained at the time of the accident. The longwall miners kept replacement bits and sprays on the longwall face and regularly replaced the bits and sprays as part of their routine maintenance. Indeed,
at 11:00 a.m. on April 5, 2010, the headgate operator of the longwall called out to the dispatcher and notified him that, among other things, 25 cutting bits had been replaced on the shearer. There is, therefore, every reason to assume that the crew was paying close attention to the condition of the bits and was carefully attending to the need to replace any worn bits. Additionally, the longwall was down until less than an hour prior to the accident because of an issue with the “B-Loc” on one of the ranging arms. If any of the cutting bits (or sprays) were worn or needed to be replaced, they would have been taken care of at this time. Moreover, post-explosion examination of the longwall shearer has shown that the cutting bits were actually in very good condition, with the exception of two lead bits, which are specifically designed to wear.

![Figure 18: Lead bit at UBB](image1)

![Figure 19: Representative UBB bit](image2)
Figure 18 is a photograph of one of the two lead bits on the UBB longwall shearer. The bit exhibits evidence of wear, as it is designed to do during the longwall mining process. Its condition is a sign of normal operation of the shearer, not a failure to maintain the shearer. Figure 19 is a photograph of one of the other cutting bits on the UBB longwall shearer. This virtually unblemished bit is more representative of the 48 cutting bits on the UBB longwall shearer in Figure 20, and is further evidence that the maintenance of the cutting bits on the UBB longwall shearer could not have contributed to the accident.

IV. Performance Applied Sufficient Amounts of Rock Dust at UBB Prior to the Explosion.

As demonstrated in Section II above, the UBB explosion was fueled by external natural gas, and coal dust did not combust significantly or contribute materially to the explosion’s energy. Despite the insurmountable body of evidence excluding coal dust as a fuel, some continue to suggest that rock dusting practices at UBB played a role in the accident. Such speculation is based almost exclusively on an MSHA methodology of collecting post-explosion dust samples that has been
discredited thoroughly for more than fifty years by experts, researchers, regulators, and courts. In fact, the evidence establishes that Performance applied sufficient amounts of rock dust at UBB, that federal and state inspectors noted adequate dusting, and that MSHA’s methods are both unreliable and ignore the obvious evidence of sufficient rock dust still present at UBB.

A. Records Maintained by Performance and by Federal and State Regulators Reflect Robust and Adequate Rock Dusting at UBB.

From January 1, 2010 through April 5, 2010, Performance disbursed approximately 1.75 million pounds of rock dust for application underground at UBB. This amount equates to roughly 18,500 pounds of rock dust for every calendar day in the first ninety-five days of 2010. Performance crews accomplished application of such vast amounts of rock dust by using sophisticated and highly mechanized equipment to ensure they coated all appropriate surfaces with uniform and generous quantities of rock dust. Rock dusting equipment in use at UBB in April 2010 included: (1) a massive track duster (a/k/a “pod” duster) that was capable of distributing tons of rock dust at a time; (2) large “slinger” dusters—very similar to a track duster but fit into the bucket of a scoop—with which Performance crews were required to rock dust all mined cuts on the continuous miner sections at the end of each shift using two-ton bags of rock dust; (3) numerous trickle dusters that used ventilation currents to continuously feed rock dust into the return and belt entries; (4) spray dusters that use hoses resembling fire hoses to apply large amounts of rock dust from the pod duster to entries adjacent to track; (5) “bantam” dusters, which are hydraulically driven machines attached to scoops or roof bolter machines that use fifty-pound bags of rock dust; (6) a battery-operated, hydraulically driven duster pulled behind a battery jeep to dust the mother belt; and finally (7) by hand on every section as mining progressed. Together, these methods of dusting relied upon Performance miners from production crews, maintenance crews, and a dedicated rock dusting crew to ensure that all areas received sufficient rock dust to remain within requisite incombustibility limits.
Notes of contemporaneous observations by federal and state mine inspectors confirm that those efforts indeed were successful. From January 1, 2010 to April 5, 2010, MSHA conducted 106 inspector visits at UBB and spent more than 650 hours at the mine, an average of 7.25 hours for every single calendar day in the first ninety-five days of 2010. State inspectors from WVOMHST also regularly had inspectors at UBB, making 15 inspector visits in the month before the accident. In fact, WVOMHST had four inspectors at UBB on March 30, 2010 alone, just six days before the explosion. Those federal and state inspectors inspected all five sections of the mine, including the three sections within the zone affected by the explosion. Neither MSHA nor WVOMHST issued any reckless disregard or unwarrantable failure rock dust violations anywhere at UBB in 2010, which certainly would have been issued had the mine dust conditions even remotely resembled the incombustible content suggested by MSHA’s flawed post-explosion dust sampling.\footnote{20}

Not only were no elevated dust citations issued, but the inspectors’ notes establish affirmatively that UBB was adequately rock dusted. For example, on March 17, 2010, a MSHA inspector noted that the Tailgate 22 section “was well rock dusted.” See Figure 21. Similarly, on March 23, 2010, a MSHA inspector on the barrier section of UBB noted “Cleaning & Dusting (OK).” \textit{Id.} Finally, a MSHA inspector noted “adequate rock dust” on the Tailgate 22 section on March 30, 2010, just six days before the explosion. \textit{Id.}\footnote{21}

\footnote{20} For those few citations that were issued relating to rock dust, the condition was immediately corrected by application of additional rock dust to abate the citation.

\footnote{21} The quoted MSHA inspectors’ notes in Figure 21 were obtained from the limited materials MSHA posted publicly on its website. However, MSHA has steadfastly—and inexcusably—refused for more than one year to produce additional inspectors’ notes in response to a pending FOIA request, forcing Performance to seek relief from a United States District Court. \textit{See Performance Coal Co., et al., v. United States Dept. of Labor, et al., Civ. Act. No. 10-1698 (RJL).} With the few inspectors’ notes released publicly showing adequate rock dusting at UBB, one can only imagine what is contained in the notes MSHA is fighting so hard to keep secret.
**Figure 21: MSHA inspectors’ notes show adequate rock dusting at UBB**

Furthermore, as discussed in detail below, MSHA conducted a rock dust survey on the Headgate 22 section on March 15, 2010, and seven of the eight samples taken were determined to be well above 80% incombustible content in laboratory testing, with the eighth sample coming back at 77% incombustible. All eight samples were compliant with the applicable legal standard. Finally, a report released by the Governor’s Independent Investigation Panel revealed that three WVOMHST inspectors testified in the investigation that rock dusting at UBB was “adequate,” “good,” and “plentiful” in the days before the explosion. See GIIP Report at 88.

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22 The MSHA survey listed the 77% sample as non-compliant, erroneously subjecting it to the 80% incombustible standard that at the time was applicable only in return aircourses. See 30 C.F.R. § 75.403. Because that sample was taken in a neutral entry, it should have been subject to the 65% incombustible standard in 30 C.F.R. § 75.403 as of March 15, 2010. The sample thus was compliant with the applicable regulatory standard by a wide margin.
Early in its investigation, MSHA released a chart to the media that was intended to suggest that the UBB beltlines were inadequately rock dusted:

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<td>No Exam</td>
</tr>
</tbody>
</table>

**Figure 22: Slide from MSHA Presentation given to family members and the press**

The MSHA chart in Figure 22 purports to be an analysis of UBB belt examination records, and compares notations of a need for rock dusting against notations in those same records that rock dust was applied to the belts. The chart is misleading and incomplete, however, in several respects: (1) Even in the belt examination records reviewed, MSHA overlooked notations where combustible accumulations were remedied by cleaning or by cleaning and dusting, rather than by just dusting; (2) MSHA ignored other mine records that reflect cleaning and dusting was performed; and (3) MSHA ignored the records of Performance’s dedicated rock dust crew, which specifically noted dusting on these beltlines that are excluded from MSHA’s chart.
For example, Figure 23 shows on-shift belt examination records from the day shift on April 3, 2010 and the night ("hoot owl") maintenance shift on the morning of April 5, 2010. The notations highlighted in yellow reflect cleaning of combustibles, the notations in green show application of rock dust, and the notations highlighted in blue reflect beltlines that were both cleaned and dusted.

In creating its chart, MSHA also ignored any records other than the belt examination records. That omission is deceptive, in that numerous other mine records document the crews’ application of rock dust.
Figure 24: Production report showing rock dusting on Headgate 22 section on April 3rd

For example, the Headgate 22 section production report in Figure 24 shows that on the evening shift of April 3, 2010—the last production shift on the Headgate 22 section before the day of the explosion—the crews rock dusted the section and return on Headgate 22. In doing so, the crew used a slinger duster powered by a scoop, which would have distributed a bulk two-ton bag of rock dust uniformly and generously over all the surfaces on the Headgate 22 section. The crew members involved in that effort recall the section looking white as snow at the conclusion of their shift. That rock dusting—and the records documenting it—are significant given MSHA’s public statements that damage on Headgate 22 was caused by a propagating coal dust explosion.\(^{23}\)

\(^{23}\) Importantly, though the Headgate 22 section crew specifically noted their rock dusting effort in their production report for the evening shift on April 3rd, that was consistent with the typical practice and Performance requirement that *every* section crew rock dust their section with the slinger duster at the end of *each* shift. That such a regular and robust rock dusting routine was exclude entirely from MSHA’s analysis further exposes how misleading that chart was.
MSHA also excluded other critical rock dusting records from its chart, including the records maintained by the UBB dedicated rock dusting crew. As the notebook in Figure 25 shows, the rock dusting crew applied rock dust to the 1 Section belt (Headgate 22) on April 1, 2010 and—significantly—to the longwall belt on April 5, 2010, the day of the explosion. Yet that crew’s dusting of those beltlines inexplicably was omitted from MSHA’s chart that purported to analyze belt dusting.
The chart in Figure 26 above is a recreation of the MSHA chart, but includes the additional information from belt examination records noting cleaning, production records noting cleaning and dusting, and records maintained by the UBB rock dust crew. The corrected chart shows significant cleaning and rock dusting was performed on the belt lines in the five days preceding the explosion, including comprehensive dusting and cleaning on April 3 and April 5. Indeed, every part of the mine identified by MSHA on its chart was in fact cleaned, dusted, or both on April 3, the last production day before the explosion.24

In reviewing this data, three additional factors must be understood: (1) The entire mine, including the longwall and all continuous miner sections, was idle on Easter Sunday, April 4; (2) The column for the day shift on April 5 does not show any corrective measures because the examination was only called out 30 minutes before the explosion and there was no time to record dusting or cleaning before the accident; and (3) Even this corrected chart does not account for the six trickle dusters that UBB operated, which continuously fed rock dust into the return and belt entries at UBB.

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B. MSHA’s Post-Explosion Rock Dust Samples Are Not Representative of Pre-Explosion Dust Conditions at UBB.

For more than half a century experts and researchers have acknowledged that an explosion’s forces and turbulence so alters the mine dust in the affected area that dust samples collected after an explosion are of no use in determining the incombustibility content of the dust before the explosion. In 1963, John Nagy and Don Mitchell, in an investigation report for MSHA’s predecessor, the United States Bureau of Mines, concluded that “[b]ecause of dust dispersion and transport during an explosion, the original composition of mine dust at a given location cannot be calculated accurately from analysis of samples collected after the explosion.” Nagy, J. & Mitchell, D.W., “Experimental Coal Dust and Gas Explosions,” United States Bureau of Mines Report of Investigation No. 6344 (1963) at p. 15. More recently, in its final accident report on the 2006 mine explosion at the Sago Mine in Upshur County, West Virginia, MSHA acknowledged that “due to the area where the explosive force propagated, it cannot be determined if these samples were contaminated by dust and other materials. Therefore, the incombustible content of the [post-explosion] samples taken could not be used to determine compliance with the regulatory requirements.” MSHA Report of Investigation, Sago Mine Explosion (2007) at p. 113. Finally, in the one recent instance in which MSHA did try to support rock dust violations with post-explosion dust samples, an Administrative Law Judge soundly rejected MSHA’s analysis and held the Secretary of Labor “failed to prove: (1) that conditions relating to the incombustible content of the mine dust did not change between the time immediately prior to the [accident] and the samples’ collection; and (2) that the sample results are sufficiently representative of results that would have been obtained at the time of the alleged violation.” Sec’y of Labor v. Jim Walters Res., Inc., 27 FMSHRC 757, 805 (2005) (ALJ).

Despite the universal rejection of post-explosion sampling as scientifically flawed and inaccurate, MSHA has relied heavily on this approach to convey the false impression that UBB was inadequately rock dusted at the time of the explosion. MSHA took 1803 post-explosion dust
samples, the overwhelming majority of which were within the area inby 78 Break that saw the greatest explosion effects and turbulence.

Figure 27: MSHA post-explosion rock dust sample map (red = non-compliant)

The map in Figure 27 plots those samples inby 78 Break, and easily could be mistaken for a map of the explosion’s effects and turbulence. In addition to the decades of research and decisions discrediting the technique, MSHA’s post-explosion samples are particularly unreliable here for two additional reasons: (1) The post-explosion samples are flatly inconsistent with dust samples from those same locations secured shortly before the explosion; and (2) The samples do not account for either the obvious contamination by fresh coal dust created in the explosion or the still-present layer of adequate rock dust beneath that contaminating layer of explosion particulate.
1. **The Validity of MSHA’s Post-Explosion Samples Is Disproved by Recent Pre-Explosion Dust Samples in the Same Locations.**

On March 15, 2010, less than three weeks before the explosion, MSHA conducted a rock dust survey on the Headgate 22 section. MSHA collected fourteen samples, six of which were too wet to test for incombustible content. Of the eight samples dry enough to test, the MSHA laboratory determined their incombustible content to be: 96.2%, 87.4%, 82.1%, 86.0%, 85.5%, 89.9%, 85.3%, and 77.0% incombustible. In stark contrast, the post-explosion sample results for the Headgate 22 section came back uniformly non-compliant by a wide margin, in most places testing below 50% incombustible.

**Pre-Explosion (March 15, 2010) Rock Dust Sample Results for Headgate 22 Section**

![Pre-Explosion Sample Results](image1)

**Post-Explosion Rock Dust Sample Results for Headgate 22 Section**

![Post-Explosion Sample Results](image2)

**Figure 28: Comparison of pre- and post-explosion rock dust samples on Headgate 22**

Figure 28 compares the pre-explosion and post-explosion rock dust samples on the Headgate 22 section. It is simply not credible to suggest that a section with an average incombustible content of greater than 86% on March 15 could have transitioned in less than three weeks to the levels reflected in the post-explosion samples. Some may suggest that such a decline could occur from mining

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25 As discussed in Section III above, if coal dust is too wet to sample it certainly is too wet to lift and combust in an explosion.
operations over those three weeks. That explanation cannot possibly account for such an astonishing decline in incombustible content—more than 40% in many locations—and further cannot be a valid explanation for two reasons: First, while active mining at the face does produce coal dust that could decrease the incombustibility content in return entries, and even to a lesser extent belt entries, it would not send coal dust into the intake air entries. In Figure 28, the middle of the three entries on the Headgate 22 section is the intake entry. Though all five samples taken in the intake on March 15 were above 80% incombustible content, twenty-three of the twenty-four post-explosion samples in that same intake entry were below 65% incombustible. This cannot be explained by ordinary mining operations, and must be attributable to the explosion. Second, as discussed above, production records for the Headgate 22 section show that the crew rock dusted the section and the return entry with a powerful slinger duster on the evening shift of April 3—the last production shift before the day of the explosion. Mining operations certainly cannot account for the discrepancy where no mining was conducted.
Similarly, Figure 29 compares pre- and post-explosion dust samples in the 21 Crossover area of UBB. In the pre-explosion dust survey MSHA conducted on December 28, 2009, approximately three months prior to the explosion, MSHA’s laboratory determined their incombustible content to be: 94.1%, 96.7%, 97.4%, and 97.1% incombustible. And yet the post-explosion samples in that same area are uniformly non-compliant; most were barely 50% incombustible. As with Headgate 22, the dramatic drop in incombustible content in the intake air entries dispels any suggestion that the discrepancies are attributable to mining or a failure to regularly apply rock dust. Indeed, in the 21 Crossover, three of the four entries are intake entries. Only the entry on the far left of Figure 29
is a return aircourse. Thus, the comparisons of pre- and post-explosion samples in identical locations proves emphatically that the post-explosion samples were contaminated by the explosion itself and cannot be used as evidence of pre-explosion incombustible content of the UBB mine dust.

2. **MSHA’s Post-Explosion Dust Samples Were Contaminated by Coal Dust Produced or Dispersed in the Explosion, and the Samples Do Not Account for the Presence of Large Quantities of Rock Dust Below the Surface Layer of Contaminating Explosion Particulate.**

One of the principal reasons that scientists and courts have rejected the type of post-explosion sampling relied upon by MSHA here is that, on the one hand, the incombustible content of post-explosion dust samples is decreased because the explosion forces and turbulence disperse rock dust particles from the affected area, while, on the other hand, the combustible content of those samples is correspondingly increased substantially by the introduction of fresh combustible coal dust that was created or dislodged by the explosion.

On the first point, the explosion process preferentially disperses the finer rock dust particles and separates them from the coarser coal dust particles, thus decreasing the incombustible content of the coarser residue that deposits within the flame zone. Typically, the average particle diameter of the pulverized limestone rock dust is some one-half to one-third of the average particle diameter of coal dust. Thus the average volume of individual rock dust particles is some $1/8^{th}$ to $1/27^{th}$ of the individual volume of the coal dust particles. Because rock dust particles are twice as dense as coal dust particles, their mass is some $1/4^{th}$ to $1/14^{th}$ of the coal particles. Thus, the intense flow velocities associated with the explosion will selectively disperse the rock dust ahead of the coal dust, denuding the residue that settles in the flame zone of its incombustible content.\(^\text{26}\)

Evidence of this phenomenon was observed in the investigation of the UBB explosion. First, with the prevailing ventilation current moving strongly towards the Bandytown fan, dispersion

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\(^{26}\) Appendix E provides a more detailed explanation of the physics underlying dust dispersion during an explosion.
of the finer rock dust particles necessarily would travel in the direction of that current and out towards the fan. However, as can be seen readily in Figure 27, the overwhelming majority of the Headgate 21 and Tailgate 21 entries out toward the Bandytown fan were inaccessible to MSHA’s investigators, and thus no dust samples were collected from that massive area into which the rock dust would have been expected to disperse. MSHA recently lowered a robotic camera down the Bandytown fan shaft and, as expected, the images revealed white rock dust dispersed from the explosion zone—and the dust sampling zone—by the explosion forces and carried out the ventilation current. See Figure 30 below.

![Figure 30: MSHA robot camera images of rock dust at base of Bandytown fan shaft](image)

Second, clear evidence of white rock dust also was captured on surveillance video as it was expelled from the two UBB mine portals shortly after the explosion. Clearly the incombustible content of the MSHA samples was decreased due to dispersion of the rock dust by the forces of the explosion.
Far more than loss of rock dust, however, the explosion’s introduction of new coal dust to the samples is the biggest driver of the decrease in incombustible content. Objects and freshly mined coal from the faces or the conveyor belt entries become airborne as a result of the explosion and strike the ribs, roof, and floor, or each other; such impacts generate fresh coal dust. At UBB, such fresh coal was displaced from locations such as the belts, the longwall panline, and the large pile of freshly mined coal in front of the longwall shearer as it cut out at the tail. All of those locations contained many tons of coal at the time of the explosion, and that coal was missing in those locations after the explosion.

The amount of new coal dust generated by such impacts depends on the friability of the coal seam, the intensity of the explosion, the number of objects thrown, and the velocity of impact. Larger pieces of freshly mined coal can be shattered to dust by such impact. Such dust settles out after the explosion and contaminates the post explosion dust samples with dust that was not present before the explosion. Moreover, where a longwall is involved, such as at UBB, additional coal dust contamination occurs when fresh dust from the caved gob is drawn into the mine as result of the negative “rebound” pressure that is developed as the explosion fireball cools.

The UBB explosion investigation scene is replete with clear visual evidence of this contamination effect.
Figure 31: Rock dust underneath contaminating explosion particulate in longwall tailgate

In Figure 31, mine rescue and investigation team members disturbed the mine dust with their footsteps, exposing white rock dust beneath the surface layer of soot and coal dust deposited by the explosion.
Figure 32: Rock dust beneath layer of contaminant on rib in Tailgate 21

Figure 32 shows an MSHA band sample for which the laboratory determined the incombustible content was 51.6%. Yet, by brushing away the layer of fresh coal dust generated and deposited by the explosion, investigators exposed uniformly adequate rock dust in both directions from the MSHA band sample. By selectively collecting the contaminant layer and not the underlying rock dust, the MSHA band sample is composed primarily of material that was not a component of that mine dust prior to the explosion and is thus irreparably compromised.
Finally, Figure 33 presents further evidence of the contamination effect. The photo shows the remainder of a brand new 2,000 pound bulk bag of rock dust located at the entrance to the Headgate 22 section. Though the bag was new and sealed immediately prior to the explosion, the explosive forces and winds ripped the paper bag apart, exposing the fresh rock dust to the mine environment for the first time. That this rock dust is coated with combustible coal dust when it indisputably was pure, 100 percent incombustible, virgin rock dust at the time of the explosion is powerful visual evidence that the entire area inby 78 Break at UBB experienced similar contamination. Thus, as leading researchers and experts have acknowledged for decades, MSHA’s
post-explosion dust samples indisputably are not representative of pre-explosion dust conditions at the mine and thus cannot be used as evidence of non-compliance with regulatory standards.

V. The Ventilation System at UBB Was Adequate and There Is No Evidence Ventilation Played Any Role in the Explosion.

UBB’s ventilation system, though rendered sub-optimal as a result of changes required by MSHA, nevertheless provided significantly more than the required amount of fresh air along the longwall face on April 5th. There is no evidence that ventilation was impeded or that methane gas accumulated anywhere in the mine due to inadequate ventilation. As set out in greater detail below, UBB’s ventilation system, even after it underwent two ill-conceived MSHA-imposed changes that reduced the amount of air ventilating the longwall by more than 40%, still greatly exceeded the regulatory requirements and the requirements of UBB’s ventilation plan and its methane and dust control provisions. The tragic accident on April 5, 2010 resulted from a sudden and massive inundation of natural gas that ignited in the vicinity of the longwall tailgate. There is no evidence shortcomings in the ventilation system contributed in any way to the accident.

A. Underground Mine Ventilation Plan Approval Process

Section 101(a) of the Federal Mine Safety and Health Act of 1977, 30 U.S.C. § 811(a), directs the Secretary of Labor to establish mandatory health and safety standards for mines. The implementing regulations set forth various requirements for a ventilation system, including the operation of mine fans; air quality, quantity, and velocity; and monitoring and evaluating the effectiveness of the system. See 30 C.F.R. §§ 75.300-75.389. In addition to following these generally applicable standards, each mine operator is also required to develop and follow a mine ventilation plan. 30 C.F.R. § 75.370(a)(1).

Ventilation plans are “designed to control methane and respirable dust and shall be suitable to the conditions and mining system at the mine.” Id. A ventilation plan “consist[s] of two parts, the plan content . . . and the ventilation map.” Id. The governing regulation spells out 51 items that
must be included in a mine ventilation plan. 30 C.F.R. § 75.371(a)-(yy). Each mine must submit an updated ventilation plan and ventilation map to MSHA annually. Before an operator may make an “intentional change to the ventilation system that alters the main air current or any split of the main air current in a manner that could materially affect the safety and health of the miners, or any change to the information required in § 75.371,” it must receive approval from MSHA to revise its ventilation plan. 30 C.F.R. § 75.370(d).

Mine operators are responsible for designing and implementing the systems to adequately and safely ventilate their mines. 30 C.F.R. § 75.370(a)(1). MSHA’s regulations require the MSHA district manager to “notify the operator in writing of the approval or denial … of a proposed ventilation plan or ventilation revision.” 30 C.F.R. § 370(c)(1). Despite this clear mandate, the practice employed by MSHA, at least in District 4 where UBB is located, was to notify operators orally (either by phone or in a meeting) that a ventilation plan or revision would be denied unless it was changed to comport with MSHA’s subjective determination of what was best for a mine. MSHA’s abuse of its ventilation approval authority had a number of effects. First, it eliminated any paper trail of MSHA’s often unfounded or idiosyncratic demands on operators. Because MSHA signaled its demands orally, it could—as it has in this and other cases—utterly shirk responsibility for the changes it imposed. Second, it placed operators at the mercy of MSHA. Without a formal denial from MSHA, an operator is without recourse to challenge MSHA’s tacit denial or required ventilation change. Third, MSHA used its regulatory authority coercively, to stop an operator from mining in order to extract unwarranted concessions in the form of modifications to or deviations from the plan that the operator deemed most suitable for its mine.27

27 The Mine Act does not provide any dispute-resolution mechanism in the event an operator and MSHA cannot agree on the terms of a ventilation plan. Nor does the Mine Act or regulations promulgated by MSHA set any limit on the time for MSHA to review and approve or deny a submitted ventilation plan. Operators are therefore dependent on MSHA to act objectively and in good faith in the plan-approval process. When MSHA fails to act in good faith – either through
MSHA’s public position that it only approves ventilation plans and does not design or dictate them, is belied by the evolution of UBB’s ventilation plan. MSHA employed coercive tactics to require Performance to alter its preferred ventilation plan in a way that Performance believed was less safe than the plan Performance engineers designed and advocated. As set forth below, these MSHA-imposed changes had a clear and quantifiable negative impact on the ventilation of the longwall face and, correspondingly, the longwall tailgate – the likely point of origin of the April 5th explosion.

B. MSHA’s Mandated Changes to UBB’s Ventilation System Rendered the System Less Effective

1. Performance’s Approved Ventilation Plan

Performance began longwall mining at UBB in April 1996. Performance utilized the same basic ventilation system for each of the first 20 longwall panels it mined at UBB. Performance submitted and MSHA initially approved a version of this same basic ventilation plan to mine UBB’s 21st longwall panel. MSHA approved the longwall methane and dust control plan on June 15, 2009. On September 11, 2009, MSHA approved UBB’s base ventilation plan and ventilation map.

By regulation, the minimum amount of air that can be used to ventilate a longwall is 30,000 cubic feet per minute (“cfm”). 30 C.F.R. § 75.325(c)(1). According to the terms of its approved plans, UBB proposed to maintain 40,000 cfm at the longwall intake as well as 400 linear feet per minute (“lfm”) at Shield #9 and 250 lfm at Shield #160. MSHA approved these airflow amounts and in so doing deemed them sufficient to properly and safely ventilate the UBB longwall panel. Even though it was only required to maintain 40,000 cfm at the longwall intake, Performance designed and implemented a ventilation system that exceeded these heightened requirements by several multiples.

unreasonable delay in its consideration of a ventilation plan or by conditioning approval of a plan on an operator’s agreement to MSHA’s demands – an operator has no remedy under the Mine Act.
UBB utilized a push-pull ventilation system. Air was pushed into the mine by two large fans and pulled through the mine by the exhausting fan commonly referred to as the Bandytown fan. Air also entered the mine through one of the entries at the Ellis Portal and was similarly pulled through the mine by the Bandytown fan. A series of ventilation controls, including stoppings, regulators, overcasts, and doors, regulated the flow of fresh air through the mine. All of the air ventilating the area of the mine inby 78 Break traveled to the Bandytown fan. The Bandytown fan pulled the return air up a 16 foot diameter shaft and to the surface.

UBB’s approved ventilation plan contained two key elements that MSHA later forced Performance to change. The first element was common longwall tailgate entries. The second element was using air from the longwall belt entry to provide additional airflow to the longwall face. Figure 34 illustrates the design and operation of the UBB longwall ventilation system before the MSHA-imposed changes.
Figure 34: Performance-designed UBB longwall ventilation system.

2. MSHA Forces Performance to Change Its Ventilation Plan to Abate a 104(d)(2) Order

UBB’s MSHA-approved base ventilation plan provided that “[a]s the air exits the longwall face and enters the tailgate it will split and the air will travel inby into the gob and go outby for at least one crosscut before entering the bleeder system.”28 This plan provision was in effect on March 9, 2010 when numerous MSHA inspectors conducted a ventilation blitz at UBB. The inspectors took air

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readings at the longwall, Headgate 22, and Tailgate 22. The MSHA inspectors found that each section had more air ventilating it than was required by law and its specific plan.

One of the inspectors issued a 104(d)(2) order for what he deemed an air reversal on the longwall tailgate. Performance immediately corrected the cited condition. Early the next morning, MSHA inspector Keith Stone traveled to the longwall tailgate to determine whether the condition had been resolved. Inspector Stone found that the air from the longwall face was traveling outby four breaks and then entering the bleeder system. Because the approved ventilation plan required that the air travel outby \textit{at least} one break, Performance was in compliance with its plan and, accordingly, inspector Stone lifted the order and permitted the longwall to resume operation. After inspector Stone exited the mine, he called MSHA District 4 Ventilation Supervisor Joseph Mackowiak to tell him what he found. Mr. Mackowiak instructed Stone to reinstate the order because Mr. Mackowiak decided that MSHA would now permit air to travel outby for \textit{only} one crosscut, despite the contrary terms of the approved ventilation plan.

MSHA’s decision forced UBB to change its ventilation plan in order to be able to resume operations. In response, Performance employees proposed alternatives to comply with MSHA’s intent without reducing the amount of air ventilating the longwall face. MSHA rejected Performance’s alternatives. Because of MSHA’s refusal to consider alternatives, UBB was left with no choice but to isolate the longwall tailgate.\textsuperscript{29} MSHA instructed Performance to submit a ventilation revision reflecting the isolation of the tailgate it had insisted on, which Performance did on March 11th. MSHA approved the plan and released the (d)(2) order that same day.

\textsuperscript{29} Isolating the longwall tailgate required building stoppings to prevent the neutral air traveling inby in the number 7 or furthest north entry of the tailgate from mixing with the air in the other entries until exactly one break outby the longwall face. In order to prevent the air coming off the longwall face from traveling more than one break outby, Performance also had to increase the amount of neutral air traveling inby in the number 7 entry. This increased airflow led to a corresponding increase in the air pressure heading inby on the tailgate and a decrease in pressure on the headgate.
MSHA’s mandated ventilation revision required increased airflow on the longwall tailgate. This increased airflow decreased the pressure differential between the headgate and tailgate and, in turn, reduced the amount of air ventilating the longwall face. After complying with MSHA’s demand to force air leaving the longwall face to travel exactly one breakout by, average longwall face ventilation decreased by more than 22%. MSHA’s own air readings immediately before it imposed the isolated tailgate on Performance show just how well the longwall had been ventilated. The inspector’s March 9, 2010 air readings were: (1) 107,310 cfm at the longwall intake (2.7 times the plan requirement and more than 3 times the legal minimum); (2) 1,792 lfm at Shield #9 (4.5 times the plan requirement); and (3) 1,328 lfm at Shield #160 (5.3 times the plan requirement). Figure 35 shows the UBB longwall ventilation system following the isolation of the tailgate.

30 On March 5, 2010, before the first MSHA imposed ventilation change, the air readings at the longwall intake from the three pre-shift reports averaged over 100,000 cfm. On March 12, 2010, after MSHA forced Performance to isolate and pressurize the longwall tailgate, the average air volume was 77,881 cfm – a decrease of more than 22%.
3. **MSHA Requires Performance to Stop Using Belt Air to Ventilate the Longwall Face Per its Approved Ventilation Plan**

The base UBB ventilation plan that MSHA approved on September 11, 2009 made clear that UBB would use belt air to assist with longwall ventilation. That plan spelled out the safety benefits of doing so and the safety precautions that UBB would take to minimize any potential danger from the use of belt air. The plan, approved by MSHA, stated:

Additional intake air to assist in the dilution of methane gas being liberated along the longwall face during mining will be supplied by the belt entry. This additional air quantity will also help remove respirable rock and coal dust away from the longwall face. The belt air will be monitored and comply with 30 CFR 75-350. Pyott Boone (Model 980A and 1703 or equivalent) CO monitors will be installed to comply with 30 CFR 75-351.
Performance utilized this plan for the first several months that it mined longwall panel 21. On December 9, 2009, in response to a proposed ventilation revision regarding the return air for the continuous miner section on Headgate 22, MSHA informed Performance that it was no longer able to utilize belt air to ventilate the longwall and that it would not approve the requested revision for the Headgate 22 return unless it included a plan to cease using belt air on the longwall. MSHA’s proffered explanation for requiring the change was that “[a] review of the mine map indicates that return air courses are available which could be utilized to modify the current belt air scheme and ventilating air current quantities are also available to accomplish the removal of belt air without creating hazards to miners working on the longwall face.”

Typically, an operator is permitted to utilize belt air to help ventilate a section if “the use of air from a belt entry would afford at least the same measure of protection as where the belt haulage entries are not used to ventilate working places.” 30 C.F.R. § 75.350(b). The use of belt air on the UBB longwall face allowed Performance to direct significantly more air across the longwall face and to do so in a safe manner with all required safety precautions. Despite the increased ventilation that the belt air provided, MSHA District 4 determined that UBB did not liberate enough methane to warrant the use of belt air. This position cannot be reconciled with the fact that, as MSHA noted in its December 9, 2009, denial, UBB was, by statute, a gassy mine. As the MSHA District Manager noted, “[p]lease be reminded that this mine is on a 103(i) inspection schedule due to its methane liberation and inadequate ventilation on a working section is both an ignition and explosion hazard.”31 Despite that by virtue of MSHA’s own testing, which demonstrated that UBB qualified as

31 Section 103(i) provides: “Whenever the Secretary finds that a coal or other mine liberates excessive quantities of methane or other explosive gases during its operations, or that a methane or other gas ignition or explosion has occurred in such mine which resulted in death or serious injury at any time during the previous five years, or that there exists in such mine some other especially hazardous condition, he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine during every five working days at irregular intervals. For purposes of this subsection, ‘liberation of excessive quantities of methane or other explosive gases’
a mine that “liberates excessive quantities of methane or other explosive gases,” MSHA steadfastly refused to permit UBB to adhere to its ventilation plan, which MSHA had approved less than two months earlier.

Although Performance disagreed with MSHA’s insistence that it cease using belt air, it acquiesced to MSHA’s demand to reverse the belt air away from the longwall face on December 21-23, 2009. Performance found that based on the design of its approved ventilation system, it could not reverse the belt air away from the longwall face. Performance officials met with MSHA District 4 officials and were able to convince MSHA to permit UBB to continue using some amount of belt air for an additional period of time. MSHA insisted, however, the Performance reverse all belt air away from the longwall face once the longwall mined past the 22 Crossover. The longwall passed the 22 Crossover and belt air was reversed, as dictated by MSHA, toward the end of March 2010. Following the belt air reversal, the air ventilating the longwall face dropped to approximately 55,000 cfm or almost 44% less than what ventilating the face less than a month earlier. Figure 36 shows the longwall ventilation system in place following the mandated belt air reversal. This ventilation system is the one that was in place at the time of the April 5th explosion.
C. UBB’s Ventilation System Was Operating Properly at the Time of the Explosion

In spite of the ventilation changes that MSHA forced upon Performance, the evidence establishes that UBB’s ventilation system was functioning properly on April 5th. In the half hour before the explosion, the section foremen of all three sections inby 78 Break called out their pre-

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Much has been made of the fact that UBB received a number of citations and orders regarding ventilation between the beginning of the longwall panel and April 5th. These violations must be considered in light of at least two important facts. First, some of these citations stemmed from Performance’s attempts to implement the sub-optimal ventilation system that MSHA had imposed upon it. Second, every violation (ventilation or otherwise) must be immediately corrected regardless of whether the operator agrees with the citation or is going to assert its right to challenge the citation. Simply put, every citation, including every ventilation citation, that had been issued at UBB prior to April 5th had been corrected prior to the explosion. UBB’s ventilation system was operating at well-above the required regulatory and mine-specific requirements at 3:02 p.m. on April 5th.
shift reports. None of these experienced miners reported anything out of the ordinary. There were no accumulations of hazardous gases and section airflows exceeded the levels required by regulation and by the approved ventilation plan. The last check of longwall ventilation prior to the explosion, which was called out less than 30 minutes before the explosion, reported 56,840 cfm at the longwall intake, 776 lfm at Shield #9 and 513 lfm at Shield #160. Additionally, numerous other experienced miners had traveled in and around the longwall on April 5th without detecting anything out of the ordinary or anything indicating that UBB’s ventilation system was compromised.

It has been alleged that the mine’s ventilation system was compromised because several air pumps utilized as part of the system that removed water from the mine had stopped working over the Easter weekend, thereby allowing water to accumulate in the mine’s bleeder entries. While some pumps may have needed to be repaired on April 5th, the bleeder entries did not flood and the mine’s ventilation system was not compromised. This conclusion is supported by two independent sets of contemporaneous records. First, UBB recorded the water level in the bleeder entries on a daily basis. These records show that the water levels recorded on April 5th were not sufficient to impede the flow of air to the Bandytown fan.

Additionally, the Bandytown fan continually records the differential pressure it must exert to ventilate the mine. A higher differential pressure reading indicates that the fan encountered greater resistance and had to work harder. A lower differential pressure reading indicates that there was less resistance. If the bleeder entries had flooded, resistance on the fan would have increased. Because UBB’s bleeder entries had flooded before – in the fall of 2009 – there is a baseline against which the April 5, 2010 fan chart can be compared. The Bandytown fan chart in Figure 37 shows how an increase in pressure caused by flooding in the bleeder entries forces the fan to work harder.
The increase in fan pressure from the rising water level is unmistakable. Nothing remotely similar to this pressure increase appears on the Bandytown fan chart for April 1st to April 5th, 2010 as shown in Figure 38.
The only significant change in the pressure on the Bandytown fan chart in Figure 38 is a decrease in pressure following the explosion when a number of ventilation controls were destroyed lowering the resistance on the fan. This fan chart irrefutably establishes that the water level in the mine did not rise to a level that adversely impacted the ventilation system.

VI. The Government’s Accident Investigation was Fundamentally Flawed.

Before all of the victims’ bodies were recovered from the mine, DOL and MSHA launched an investigation of the accident. The stated objective of this exercise was to identify the cause of the accident within a week. Although UBB was subject to a control order that limited all underground
activity to rescue and recovery efforts, and the explosion temporarily created a dangerous mine environment unsuitable for any investigative work, MSHA met its deadline. On April 15, 2010, MSHA concluded that the explosion was caused by “a failure first and foremost of management.” Without corroborating evidence, or any examination of the accident scene, or even a review of company records, MSHA satisfied itself that Performance was to blame for the accident.

Armed with that conclusion—a conclusion that conveniently diverted attention from the agency’s own pre-accident role in inspections of UBB and UBB’s ventilation plans—MSHA conducted its investigation with the singular goal of confirming its premature conclusion that Performance was to blame. In the process, MSHA rejected any other possible cause of the accident. Far more troubling, however, MSHA decided not simply to control the terms of the public debate, it sought also to control the form, quality, and quantity of the data that would be collected during the course of the investigation. MSHA rejected proposals by Performance to ensure transparency and completeness, it repudiated investigative protocols that it had embraced following the Sago explosion, and it actively thwarted Performance’s efforts to independently access and assess evidence that was contrary to MSHA’s preconceived conclusion. Performance took the position from the outset that it would accept and learn from any conclusions compelled by the evidence; MSHA took the opposite view: From the beginning, it took steps to collect only that evidence compelled by its conclusion.

First, MSHA lured witnesses, sometimes under false pretenses and often without an attorney or representative, to secret interviews where it framed questions to induce testimony to support MSHA’s already-existing conclusion. The secret interviews ignored the dictate of Congress, and the circumstances surrounding the interviews raise serious questions as to the proceedings’ fairness and objectivity.
Second, MSHA prevented Performance from exercising its statutory right and mandate to investigate the cause of the accident. Instead, MSHA imposed on Performance an underground investigation protocol that prohibited the company from utilizing basic and essential investigative tools. Although the protocol was imposed under the pretext of safety, it succeeded only in advancing MSHA’s goal of eliminating transparency and preserving the secrecy of its investigation.

Third, under threat of citation, MSHA repeatedly ordered Performance to destroy evidence of the accident prior to the completion of the company’s underground investigation. Those directives frustrated Performance’s ability to conduct a full and complete investigation, deprived the company of its legal right of access to evidence, and, most important, prevented the development of a complete evidentiary record.

Fourth, MSHA, through its Chief Investigator of the UBB accident, Norman Page, threatened and attempted to intimidate Performance’s scientific experts with retaliatory action in order to influence the experts’ work product and conclusions, conclusions that undermine MSHA’s conclusion and that are supported by overwhelming evidence.

MSHA’s conclusion that Performance was to blame for the UBB accident was the driving force behind the agency’s investigation of the accident. MSHA’s accident investigation was not designed to review the evidence and determine the cause of the accident; rather, MSHA started with its conclusion and directed its investigation to find support for it.

A. MSHA Conducted Secret Interviews Designed to Advance its Predetermined Conclusion as to the Cause of the Accident.

Despite MSHA’s repeated calls for a transparent investigation of the UBB accident, its witness interviews characterized a government investigation founded upon secrecy, deception, and obstruction. MSHA followed an unprecedented witness interview protocol that sought to exclude Performance and the public from the interview process. MSHA’s secret interviews made clear that
the agency was not concerned with discovering credible information regarding the cause of the accident.

On May 7, 2010, MSHA unilaterally issued its witness interview protocol. The protocol’s primary focus was to foreclose not only Performance’s participation in the interviews, but also the company’s attendance. The protocol barred Performance from all interviews that did not involve its “management.” MSHA then adopted an unwarranted and restrictive definition of “management” that excluded Performance representatives from most MSHA interviews of supervisory employees. MSHA also prohibited Performance from attending interviews of former management, though they were called to testify solely regarding their work as Performance management. As MSHA recognized in the protocol, “relatively few employees are likely to be considered ‘management’” under the agency’s standard. With Performance effectively excluded, MSHA could, and did, structure their interviews to obtain information to support their preordained conclusion as to the cause of accident without anyone questioning the agency’s approach or its motivation.

MSHA employed an interview process where secrecy was paramount, trickery was commonplace, and placing blame on Performance was the objective. MSHA’s closed-door interviews were conducted so that only the government and the witness had knowledge of its occurrence and substance. In scheduling interviews, government officials frequently failed to disclose, or affirmatively misrepresented, to the witness their identity and the purpose of the interview. Witnesses, accordingly, were lured to “voluntary” interviews under false pretenses and afforded no opportunity to contact or retain counsel. When a witness exercised his right to be represented by counsel—a right expressly recognized even in MSHA’s interview protocol—the government engaged in an intimidating examination of the witness and counsel to undermine the attorney-client relationship and to ensure its control of the interview.
The government continued its bullying tactics during the interviews. Officials posed threatening and leading questions that coerced witnesses to place blame for the accident on Performance. Then, at the end of the interviews, in order to safeguard its conduct from scrutiny, the government instructed the witnesses not to disclose any information shared or learned in the interviews. Apart from possessing no statutory or regulatory authority to “gag” a witness, MSHA’s conduct unfairly hindered Performance’s ability to conduct its own investigation of the accident.

MSHA’s handling of the interview transcripts is equally troubling. For more than a year, MSHA has refused to provide witnesses with an opportunity to review the transcripts of their interviews to identify any errors. Although accurate testimony is the hallmark of any valid investigation, MSHA rejected witnesses’ requests to review their transcripts. In the last month, MSHA finally began publically to release the transcripts of a limited number of witness interviews; however, the agency provided the witnesses with little notice of the release and with no opportunity to review the transcripts for error. In fact, an attorney with the DOL Solicitor’s Office recently informed a witness’s attorney that many future transcripts will be released without the witnesses’ review for error.

MSHA also ignored the strict limits that the U.S. Congress placed on its investigative authority. By statute, Congress contemplated that MSHA would conduct most of its investigation publicly, and, so, limited the agency’s subpoena authority to public settings. Ignoring these limitations, MSHA importuned the WVOMHST to exercise its subpoena power for MSHA’s benefit.33 MSHA’s circumvention of the law allowed the agency to avoid independent scrutiny of

33 See 30 U.S.C. § 813(b) (“[T]he Secretary may, after notice, hold public hearings, and may sign and issue subpoenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and administer oaths.”); MSHA’s Accident/Illness Investigation Procedures Handbook PH00-I-5, at Ch. 3, VI.H., p.25 (stating “[w]itness interviews are completely voluntary”); Statement of M. Patricia Smith, Solicitor of Labor, U.S. Department of Labor, Before the Committee on Education and Labor, United States House of Representatives (July 13, 2010)
its misguided investigation and to attempt, in secret, to fashion reasons to blame Performance for the accident.

B. MSHA Prevented Performance from Conducting its Statutory-Mandated Investigation and from Using Basic Investigative Tools.

MSHA’s troubling conduct extended into the underground phase of its accident investigation. In its formulation of an investigation protocol, MSHA thwarted Performance’s ability to exercise its statutory right to investigate the cause of the accident. At the same time, the protocol was designed to keep MSHA’s investigation—and its obvious conflict of interest in investigating itself—closed to public scrutiny.

On June 25, 2010, MSHA began its underground investigation. Because federal law requires an operator, in the event of an accident, to conduct its own independent examination, Performance should have been permitted to conduct its underground investigation at that time and proposed protocols – founded upon MSHA’s own procedures following the Sago accident – that would have ensured the collection and sharing of the reliable data based upon the most advanced technologies. MSHA, however, unilaterally imposed on Performance, over Performance’s objections, an investigative protocol that prohibited the company from utilizing basic investigative tools, such as photography, modern mine mapping, and dust sampling.

(“Currently, the Mine Act only authorizes the Secretary to issue subpoenas in connection with a public hearing.”).

On May 16, 2010, Secretary Solis promised that MSHA’s UBB investigation will include an “unprecedented number of public hearings … including one where miners, contractors, mine officials and others with knowledge of the Upper Big Branch Mine will participate. We will use subpoena power if necessary to ensure that happens.” See Secretary Hilda L. Solis, Disaster probe must be protected, CHARLESTON GAZETTE, May 16, 2010, available at http://www.wvgazette.com/Opinion/OpEdCommentaries/201005160491 (last visited May 27, 2010). Over a year later, MSHA has not held a single public hearing and has decided to illegally exploit the state’s subpoena power.

34 See 30 U.S.C. § 813(d) (“All accidents . . . shall be investigated by the operator or his agent to determine the cause and the means of preventing a recurrence.”); 30 C.F.R. § 50.11(b).
Although MSHA placed those restrictions on Performance under the guise of safety,\(^{35}\) they were not necessary to protect the safety of persons in the mine. Indeed, MSHA itself took photographs, mapped underground, and collected dust samples, so by MSHA’s own admission there was nothing intrinsically unsafe about the data gathering that Performance proposed. Moreover, to the extent that mapping quickly, efficiently, and accurately enhances safety by minimizing time spent underground, Performance’s technologically-advanced mapping methodology was safer than MSHA’s antiquated practices.\(^{36}\)

Instead, MSHA crafted its protocol to limit Performance’s underground investigation and to preserve the secrecy of the agency’s. Performance submitted for MSHA’s approval a lengthy, detailed investigation plan. Based on best practices of the mining industry, the plan set forth an operational framework for the joint gathering of facts and material evidence relevant to the UBB accident. In its plan, Performance expressly offered in advance to share with MSHA all photographs and mapping data collected in Performance’s investigation, greatly enhancing the quality and quantity of information available to MSHA’s investigation – regardless of whether they might point to failures by Performance. Although access to better information and more evidence is a welcomed prospect in any investigation searching for the truth, MSHA summarily rejected Performance’s plan.

MSHA chose a plan that prevented Performance from independently gathering evidence and that restricted the number of company representatives underground to witness MSHA’s activities. That determination to bar Performance from fully participating in the accident investigation permitted MSHA to direct the investigation in ways that shielded the agency from culpability due to

\(^{35}\) See 30 U.S.C. § 813(k) (allowing MSHA to impose restrictions on an operator after an accident if necessary “to insure the safety of any person in the coal or other mine”).

\(^{36}\) Appendix F describes in detail the benefits and capability of the advanced laser scanning utilized in the company’s investigation.
its pre-accident role in the mine. For instance, in the course of the underground investigation, Performance located a suspicious crack in the mine floor immediately outby the longwall shearer that potentially served as the source of a large-scale natural gas inundation. After MSHA’s investigation of the crack, Performance requested an exemption from the restrictive protocol to conduct its own thorough investigation of the site. MSHA rejected the company’s repeated requests based on generic and unspecified safety grounds, denying Performance access to critical evidence that could defeat MSHA’s intention to place the blame for the accident on Performance. MSHA finally acceded to Performance’s request, but only after disturbing the crack and altering the evidence. In similar ways throughout the underground investigation—which the agency served as the gatekeeper to all underground evidence—MSHA’s protocol eliminated transparency and accountability in the agency’s underground investigation.

C. MSHA Ordered the Destruction of Evidence.

As MSHA concluded its underground investigation and Performance prepared to begin its investigation, MSHA insisted that the company perform certain tasks that would destroy critical evidence from the UBB accident. MSHA used its citation authority and the threat of delaying Performance’s investigation to try to coerce the company to take such action. As noted above, Performance had the legal right and duty to conduct an independent investigation of the UBB accident. MSHA acknowledged, in sworn statements, its responsibility to preserve evidence for the purpose of Performance’s investigation.

By way of example, MSHA ordered Performance to rock dust the mine as a pre-condition to the company’s independent investigation. Rock dusting literally whitewashes the mine and alters or destroys critical evidence from the accident, a fact Mr. Page well-understood: He directed MSHA’s months-long investigation without requiring rock dust, which would have irrevocably destroyed any evidence of conditions at the time of the explosion. Nonetheless, Mr. Page continued to insist that
Performance rock dust affected areas of UBB before it could undertake its own independent investigation, even threatening the company with a citation for impeding MSHA’s investigation if it did not comply with his demand.

Similarly, in September 2010, as the company tried to balance MSHA’s demand to control dust against the need to preserve critical evidence, MSHA again penalized Performance for protecting its right to access evidence. In that instance, MSHA cited Performance for impeding the investigation because it used a dust suppression method—water—in travelways that actually took into account the preservation of evidence. As a result, MSHA unfairly forced Performance into a Catch 22, in which the company was required either to accept a punitive impeding citation or use a potentially destructive dust application method that violated the evidence preservation requirements of federal law. The very next day, leveraging the previous day’s impeding citation, MSHA insisted that Performance apply rock dust to abate violations in outby areas of UBB. Although Performance objected to any rock dusting prior to the completion of its investigation, Performance heeded Mr. Page’s threat that the failure to rock dust as instructed would result in a citation. After acceding to MSHA’s demands, the agency cited Performance under Section 103(j) for “fail[ing] to take appropriate measures to prevent the destruction of evidence,” the very reason Performance resisted rock dusting in the first place.

**D. MSHA’s Chief Investigator Engaged in Witness Intimidation, Abuse of Authority, and Obstruction of Justice.**

Just as troubling, Mr. Page retaliated against Performance’s scientific experts in order to influence the experts’ work product and conclusions.\(^{37}\) His conduct was contrary to law, to basic

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\(^{37}\) This section provides an overview of Mr. Page’s wrongdoing and obstruction of a search for the truth in the UBB accident investigation. On April 29, 2011, Performance filed a formal complaint (“OIG Complaint”) against Mr. Page with Mr. Daniel R. Petrole, the Acting Inspector General of DOL. The OIG Complaint provides greater detail of Mr. Page’s misconduct. A copy of the OIG Complaint is attached as Appendix G.
principles of justice, and to the legitimate interests of all stakeholders – Performance, the victims and their families, and the government – to ensure that the investigation was open, honest, and complete.

The intimidation of Performance’s experts began in October 2010 when MSHA issued a citation against Performance and an order against Dr. Christopher Schemel, a consulting expert retained by Performance’s counsel in its internal investigation. MSHA suddenly determined that Performance’s expert, who had been on the investigation teams and traveling underground since the start of the underground investigation, could no longer travel underground because he had not completed “new miner” training. The frivolous nature of the order was plain as the scientific expert was not a miner and the regulatory criteria for the training were not met. The citation and order, rather, were an unprecedented and unlawful attempt to exclude and intimidate one of Performance’s lead scientific experts on the eve of its independent investigation and threatened Performance’s constitutionally-guaranteed right of access to evidence.

During the course of Performance’s underground investigation, another of Performance’s scientific experts, Dr. Pedro Reszka, advised MSHA that a miners’ representative on his investigation team engaged in unsafe behavior underground. In response to Dr. Reszka, MSHA, by their own admission, retaliated against the expert, issuing an order and citation against Dr. Reszka and Performance. DOL’s Office of the Solicitor, recognizing the retaliatory nature of those actions, agreed to vacate both the order and citation. Mr. Page, however, did not agree with that course of action.

Following the withdrawal of the citation, Mr. Page requested a meeting with Performance and Dr. Schemel, ostensibly to discuss vacatur of the retaliatory order and citation. When the parties assembled, Mr. Page excluded everyone from the conference room except Dr. Schemel. Having cornered Dr. Schemel under false pretenses, Mr. Page asserted his authority underground
and expressed anger that DOL officials agreed to vacate his order without consulting him. Mr. Page warned that if Performance and Dr. Schemel’s firm continued to rely upon the agreement reached by their lawyers, he would have UMWA and MSHA representatives scour Performance’s investigative notes, photographs and videos for evidence to support retroactive citations against Dr. Schemel, his firm, Performance, and others. Mr. Page then attacked Dr. Schemel’s role in the investigation and attempted to influence his conclusions and work product. Mr. Page repeatedly asked Dr. Schemel what his “intent” or “purpose” was, alleged that Performance’s only purpose was to discredit MSHA, and suggested that Dr. Schemel would have to manipulate data and violate ethical rules in order to reach conclusions that differed from those of MSHA. Mr. Page then ended the confrontation with a threat to Dr. Schemel’s livelihood, warning that MSHA and the UMWA could similarly target him on future mine projects anywhere in the United States, effectively making it impossible for Dr. Schemel to work in the mine industry. Neither MSHA nor Mr. Page disputes this account of Mr. Page’s threats and intimidation.

VII. CONCLUSION

The overwhelming weight of the evidence and scientific data indicates that a massive inundation of natural gas caused the UBB explosion. Moreover, the evidence does not disclose any failure by Performance that contributed to the explosion or to the number of fatalities, including in the areas of rock dusting, ventilation or shearer maintenance. Massey will rely on these important findings and any other objective data to determine accurately what measures might be undertaken to make mining safer and to mitigate or prevent such accidents in the future.
APPENDIX A

Gas Detection Equipment in Use at UBB on April 5, 2010

Personal hand-held multigas detectors and fixed gas detection monitors were in use at UBB at the
time of the explosion. The gas detection instruments in use included the following:

**Solaris Multigas Detectors**

Manufactured by Mine Safety Appliances, Inc. (“MSA”), Solaris Multigas Detectors (“Solaris
Detectors”) are personal portable instruments designed to provide simultaneous and continuous
detection of certain gases. As used at UBB, Solaris Detectors were configured to monitor
combustible gases, carbon monoxide (CO), and oxygen (O₂). The combustible gas sensors on the
Solaris Detectors used at UBB were calibrated for methane detection, on a scale of 5.0% by volume.
Solaris Detectors meet MSHA’s criteria for methane detection and MSHA has explicitly approved of
their use in underground mines.

The Solaris Detectors used at UBB were fitted with a datalogging feature capable of downloading
recorded information to a computer. Solaris Detectors are designed to record and store data for an
average of 24 hours (at one minute intervals) without overwriting existing data. The datalog entries
contain the date, time, and a record of the peak and average readings for each gas sensor.
Atmospheric temperature records are logged at fifteen minute intervals. The time between data
records is user-selected, ranging from fifteen seconds to fifteen minutes.¹

The types of data collected by Solaris Detectors include:

**Session Log:** The session data log records instrument and sensor status upon power up. The
session log records gas readings that have reached a determined setpoint. The event log
records when alarm setpoints are reached for each individual sensor. This data is recorded
on fifteen second intervals as needed. The gas readings document certain parameters, such as
the peak and minimum concentrations, and the time weighted averages of the selected gases.

**Periodic Log:** The periodic data log records at predetermined intervals the values for each
sensor. At the time of the explosion the Solaris Detectors at UBB were programmed to
collect sensor information at three minute intervals.

The Solaris Detectors used at UBB were calibrated with 2.5% (by volume) methane, in compliance
with 30 CFR Part 75, which requires that the detector must be operated in the 0-5% by volume
methane mode.

Solaris Detectors utilize a triple-alarm system, alerting its user visually, audibly, and by vibration
when gases exceed preset concentrations. The detectors have two separate alarms that can be set
independently for “low” and “high” gas concentrations. The detectors have one or more red light
emitting diodes located on the top, side, or front of the instruments. A 100 decibel alarm is
produced by a speaker located within the instrument. A vibratory alarm is produced by a motor that
rotates an eccentrically weighted shaft located inside the detector.

¹ As set out below, in the event of an alarm, Solaris Detectors record data in the shortest possible interval: 15
seconds.
### Table 1 Alarm Setpoints

<table>
<thead>
<tr>
<th>Alarm Setpoints</th>
<th>Alarm Low/High</th>
<th>STEL</th>
<th>TWA</th>
<th>Measurement Sensor</th>
<th>Sensor Part No. (MSA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>35 PPM /100 ppm</td>
<td>400</td>
<td>35</td>
<td>Electrochemical Sensors</td>
<td>Button Cell Sensor 10046944</td>
</tr>
<tr>
<td>Methane (CH₄)</td>
<td>1% / 5%</td>
<td>--</td>
<td>--</td>
<td>Catalytic Sensor</td>
<td>Combustible Sensor 10046947</td>
</tr>
<tr>
<td>O₂</td>
<td>19.5% / 23.0%</td>
<td>--</td>
<td>--</td>
<td>Electrochemical Sensor</td>
<td>Sensor 10046946</td>
</tr>
</tbody>
</table>

- PPM (Parts Per Million) - A “10,000 parts per million” gas concentration level equals a 1% by volume exposure.
- STEL - Short-term exposure limit
- TWA – Time-weighted average

### Table 2 Alarm Setpoint Features

<table>
<thead>
<tr>
<th>Gas Type</th>
<th>Range</th>
<th>Resolution</th>
<th>Alarm Details</th>
</tr>
</thead>
</table>
| Methane (CH₄) | 0-5% | 0.05% | • Alarms sound when concentrations reach:  
- Alarm Setpoint or 5% CH₄  
• Alarm Setpoint:  
- Alarm sounds - Alarm lights flash - CH₄ flag above the concentration flashes.  
*To silence the alarm, press the RESET button.  
NOTE: When the combustible gas indication reaches 5% CH₄, the LockAlarm™ circuit locks the combustible gas reading and alarm and:  
- Alarm sounds - Alarm lights flash - 5.00 appears on the display and flashes.  
*This alarm cannot be reset with the RESET button. |
| O₂       | 0-25% | 0.1% | • Two conditions trigger the alarm:  
- Too little oxygen (deficient) - Too much oxygen (enriched).  
Alarm setpoint is reached for either of the above:  
- Alarm sounds - Alarm lights flash - % O₂ flag above the concentration flashes. |
| CO       | 0-500 ppm /1 ppm | | Alarm Setpoint  
- Alarm Sounds - Alarm Lights flash - PPM flag above the concentration flashes. |

The gases monitored by the Solaris Detector depend on the type of sensors installed in the detector. As stated, the detectors used at UBB were configured with methane, CO, and O₂ detection sensors. A brief discussion of those sensors based on information provided by the manufacturer is outlined...
Carbon Monoxide (CO): CO detection is accomplished by use of an electrochemical sensor, which uses an electrochemical reaction to provide an electrical output proportional to the measured gas concentration. The sensor detects a maximum CO level of 500 ppm at a resolution of 1 ppm. At CO concentrations exceeding 500 ppm, the Solaris Detector display screen will display 500 ppm.

Combustible Gas/Methane: Combustible gas detection is accomplished by use of a catalytic sensor. The combustible gas sensors on the units used at UBB were calibrated for methane. Methane is a combustible gas and has a vapor density lighter than air, therefore, unlike heavier gases, calibrating the sensitivity of the sensor to methane can help predict when gas or vapor are accumulating in areas within the mine.

A combustible gas reading of “5.00” indicates the atmosphere is above 5.00% CH₄ (by volume), and an explosion hazard exists. In such cases, the instrument LockAlarm feature activates, which ensures that the unit will remain in alarm mode whenever combustible gas levels reach 5% of the LEL.

Oxygen (O₂): The percentage of oxygen is detected by using a electrochemical sensor. The Solaris Detector alarms in both oxygen deficient and rich environments.

Longwall Face Gas Detection

Following the explosion, two face methane detection devices were recovered from the longwall shearer. UBB’s longwall utilized two fixed methane monitors. A stationary monitor was mounted on the inby side of the longwall pan line at approximately shield 174. A second methane monitor was affixed to the longwall shearer itself and traveled back and forth along the panel with the shearer. The longwall shearer in use on April 5, 2010 is a Model 7LS manufactured by Joy Mining Machinery. The methane detection system, manufactured by CSE Corporation, was comprised of three main components including the two detection units, control units, and a power supply. The system was incorporated into the Joy Network Architecture system that allows for shearer data to be transmitted to the headgate and from there to the surface. The face methane monitoring system was set to provide alarms when set methane concentrations were detected. The detection units are wired to shut down the machinery if the methane threshold concentration is exceeded. Analysis of the detection units and datalogging information is ongoing.

Pyott Boone Data Logging System

UBB utilized a computerized fixed gas monitoring system manufactured by Pyott-Boone Electronics that was in use on April 5, 2011. Portions of the hardware and software associated with this system, called “MineBoss” Monitoring and Control System were evaluated to determine operational status. Additionally, data associated with recordable events stored in the computer was extracted and a copy of the computer's hard disk drive was made.

UBB used an Atmospheric Monitoring System (“AMS”) to detect gases that might result from a fire in the mine. The AMS was a Pyott-Boone Mineboss system that included a computer located on the surface in the dispatcher’s office, which had multiple surface and underground sensors. The AMS required only one computer for the system to function. The system monitored the CO levels at all of its sensors, and showed belt operations and power status. The system reported the underground CO levels to the surface and stored this information in an “event log.”
APPENDIX B
Dr. Martin Hertzberg
Teacher and Consultant, Science and Technology

Combustion Research, Basic and Applied  Gas and Dust Explosion Prevention
Fire Research  Industrial Safety  Detection Systems
Instrumentation  Environmental Sciences  Education in Science

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EDUCATION  Ph. D. Chemistry, 1959, Stanford University, Stanford, California
BA, cum laude, 1949, New York University, Heights Campus, Bronx, New York
Certificate in Meteorology, 1954, U S Naval Postgraduate School, Monterey, California

HONORS  Fulbright Professor of Science, American University in Bulgaria, 1992
Meritorious Service Award, U S Department of the Interior, 1991. Foreign Visiting
Scholar, National Center for Scientific Research (CNRS), Orleans, France, 1988
Phi Beta Kappa, 1949  Phi Lambda Upsilon, 1957

EXPERIENCE
1993-2004, University of Northern Colorado, Aims Community College, Colorado Mountain
College, Vail Valley, and Squaw Valley Academies: Instructor of chemistry, physics,
math., french, and german. Penn State-Mont Alto, and Lock Haven University: taught
mechanics, and laboratory courses in physics and chemistry. Independent consultant on
fire and explosion accident prevention and investigation.

1992  Fulbright Professor of Science, American University in Bulgaria. Taught courses
in environmental science and physics, and developed a cooperative research program.

Research Center, Fire and Explosion Prevention. Group Supervisor for explosion testing
and evaluation of mineral and industrial dusts and gases. Research results were of basic
interest and were widely published. They were also used in evaluating hazards involved in
mining and other industries. Served as consultant to the Electric Power Research
Institute, the Department of Energy, and the National Academy of Sciences on nuclear
reactor safety issues. Consultant for the Mine Safety and Health Administration on fire and explosion prevention. Supervised complementary research on thermal pyrolysis mechanisms related to coal combustion technology.


1961 - 1964  Physical Chemist, Republic Aviation Corporation, Farmingdale, N. Y. High power and chemical lasers, spectroscopy, optics, and space technology.


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**RESEARCH INTERESTS AND CAPABILITIES**

*Combustion Science and Technology:* Flame propagation in heterogeneous systems such as pulverized coal, metal dusts, gas/dust mixtures, propellants, and explosives; fire and flame structure; flammability limits, extinguishing fires and explosions; thermal pyrolysis of solids; ignition; spontaneous combustion; optical pyrometry; and fire detection systems.

*Development and Engineering:* Fire and explosion prevention in mines, power plants, cement plants, and other industries - mineral, chemical, petroleum, agriculture, fuels, and transportation; hazard analysis for prevention, detection and extinguishment; instrument design and development; ionization smoke detection; mass spectrometry; optics, lasers, and infrared systems design; control of combustion generated pollutants; environmental sciences; meteorology; energy resources, and global climate issues.

*Publications:* Senior author of over 100 publications and many patents; a detailed list is available, as are reprints for study and evaluation.

*Foreign Travel:* Extensive travel experience in France, England, China, Israel, Poland, Bulgaria, Russia, Scandinavia, and Germany; conversant in French and understand German.
Mr. Baker’s career has focused on explosion and combustion phenomena. He has conducted numerous R&D projects, hazards analysis and engineering studies involving blast effects from a wide variety of explosion sources, blast loads, fragmentation effects, debris throw, blast damage and personnel injury. Injury prediction and risk analysis have also been the subject of Mr. Baker’s research; he has contributed to the development of a building occupant vulnerability model.

Mr. Baker’s experience with explosion phenomena includes experimentation. He conducted a R&D program to develop a distributed explosives systems to neutralize landmines, testing the system both on land and in shallow water to investigate blast output and sympathetic detonation of an acceptor charge. He has conducted tests to study charged shape initiation of cased acceptor charges from long standoffs, with the acceptor charges positioned above ground and buried. Mr. Baker researched airblast propagation through openings into buildings and he designed and tested passive devices to protect ventilation systems, which resulted in a patented design. He contributed to the design of a vapor cloud explosion test apparatus and participated in vapor cloud explosion tests. Mr. Baker also developed shock tubes to simulate the blast loading from very large explosive charges and vapor cloud explosions. He subsequently tested glass/glazing systems to protect building occupants from glass fragments from vapor cloud explosion threats.

Mr. Baker has worked on numerous safe siting, safety analysis review, consequence analysis, explosion hazard analysis and blast-resistant structural design projects during which he predicted internal and external blast loads from deflagrations or detonations. The blast sources have included high explosives, runaway chemical reactions, dust explosions, electrical arc, vapor clouds, bursting pressure vessels, and propellants. He has predicted fragment size, velocity, and throw for bursting pressure vessels and cased explosives. Mr. Baker has inspected numerous petrochemical plants, specialty chemical plants, refineries, offshore platform, and other industrial facilities, identified explosion hazards and developed explosion scenarios. He has conducted facility-wide risk analyses to predict the risk to personnel from potential explosion hazards. Mr. Baker also provides short course instruction in blast and fragmentation effects.

Mr. Baker has investigated over 85 accidental explosions, both domestic and international, to determine the number and magnitude of explosions, their locations on the site, probable causes of initiation of each explosion, and root cause of the accident. These accidents include internal and external vapor cloud explosions at refineries, chemical plants, offshore platforms, oil/gas wells, and houses; an ammonium-perchlorate plant explosion; an electrical arc in a rail-gun research laboratory; runaway reactions in reactors, pipes and tanks resulting in vessel burst and fragmentation including an ethylene oxide reactor, a waste products mixing tank, an agricultural products settling tank, ammonium nitrate reactor, and a loop reactor, a fertilizer pump, and a pressure relief valve; large power generation boiler explosions; BLEVEs of rail cars and process vessels; and dust explosions in food processing, grain, rubber recycling, foundry, and rubber compounding facilities. Mr. Baker has also designed and conducted tests for recreation purposes in accident investigations and to evaluate functionality or performance of equipment recovered from accident sites. He has developed numerous protocols for inspections and tests of evidence in-situ and in laboratories and facilitated the execution of numerous protocols in cooperation with government and private investigators. He has provided accident investigation training to private industry and government personnel.

Mr. Baker has managed a number of projects to develop computer programs to calculate the blast loads on structures from high explosive, vapor cloud explosion, and bursting pressure vessel sources considering ground reflection, Mach stem formation, receptor structure orientation, and reaction rate. He was involved in the development of a hydrocode to predict bursting pressure vessel and vapor cloud explosion blast parameters, and with the use of this code to develop blast curves for both classes of explosions.

Professional Registrations/Certifications: Registered Professional Engineer (Texas), Certified Fire and Explosion Investigator (CFEI)
Professional Memberships: American Society of Mechanical Engineers (ASME); American Institute of Chemical Engineers (AIChE); National Fire Protection Association (NFPA), National Association of Fire Investigators (NAFI); National/Texas Society of Professional Engineers (NSPE, TSPE)
Committee Memberships: NFPA 921, Guidelines for Fire and Explosion Investigations; API Facility Siting Task Force; CCPS Vapor Cloud Explosion Committee; ACI Committee 370, Short Duration Dynamic and Vibratory Load Effects
Curriculum Vitae
Christopher F. Schemel, Ph.D.

Professional Overview

Dr. Christopher Schemel is an internationally recognized expert in the prevention and investigation of catastrophic fire, explosion and thermal runaway incidents. His global consulting expertise includes analysis of catastrophic fire & explosion events, system level fire & explosion analysis and, the analyses of safety systems, specific to fire & explosion safety in the process industries, oil & gas operations (on & offshore), mining operations, combustion systems, material fire performance and general manufacturing fire safety. He is president of Delta Q Fire & Explosion Consultants, Inc. with offices in Marco Island, FL and the Washington, DC metro area and routinely works on projects worldwide.

Dr. Schemel holds a doctorate from the prestigious School of Engineering and Electronics, Building Research Establishment Center for Fire Safety Engineering at the University of Edinburgh in Edinburgh, Scotland. He also has a master’s degree in Chemical Engineering and undergraduate degrees in both Chemical Engineering and Social and Behavioral Sciences from the University of South Florida.

Professional Experience

2010-Present --- President, Delta Q Fire & Explosion Consultants, Inc., Marco Island, FL

Dr. Schemel formed Delta Q to fill a void in the existing fire and explosion analysis services offered worldwide. During his nearly 20-year career Dr. Schemel has focused on understanding process safety systems, root cause analysis and consequence assessment as these systems and concepts relate to catastrophic fires and explosions. He is a specialist at understanding systematic behavior and how intense thermal incidents affect that behavior.

Dr. Schemel is a recognized global expert in leading large loss, multi-disciplined professional teams providing comprehensive incident investigations and scientific reconstruction analyses. He provides complex process fire and explosion hazard evaluations using multi-disciplined and state-of-the-art approaches.

Delta Q is highly experienced in understanding fire or explosion events and working with other experts in various engineering systems and in-house engineering expertise to provide the absolute best possible analysis of an incident. Dr. Schemel’s team of highly qualified chemical engineers, mechanical engineers, fire protection engineers and industrial hygienist offers a unique perspective on how the conditions that lead to a fire or explosion can take place in a wide range of engineered systems and help develop methods to prevent recurrences.

2003-2010 --- Senior Vice President, Packer Engineering Inc., Naperville, IL

During his seven-year tenure, Dr. Schemel supported and led the Packer Engineering Fire Science & Explosion Analysis Group. He investigated and reconstructed fire and explosion related issues and events including fire behavior, explosion dynamics, smoke and gas movement, ventilation and inert system analyses, material properties, fuel properties, vapor cloud explosions, source terms, vapor cloud dispersion, ignition mechanisms and blast energy estimates for a multitude of high-profile clients. His extensive experience included work with large scale flammable/combustible liquid storage facilities, mining
operations, semi-conductor facilities, pharmaceutical manufacturing facilities and general storage facilities, among others.

1999-2003 --- Senior Engineer, Combustion Science & Engineering, Inc., Columbia, MD

Dr. Schemel led projects related to fire science, fire safety engineering, fire incident investigations and fire hazard analyses. He provided statistical analyses and designed experiments to support research and development efforts. He was a noted inventor on three projects in which he was successful in procuring patents.

He also participated in operational risk quantification projects for U.S. Antarctic flight operations, the development and patenting of a smoke detector notification device, funded by the National Institutes of Health, for the hearing-impaired, the development of a lean, pre-mixed combustor fuel conditioner (U.S. patent), spontaneous combustion and other fire research, and third party commercial product development/patent support projects.


Dr. Schemel performed fire and explosion hazard analyses and provided general chemical and process engineering support for several operational areas. His fire and explosion analysis experience included work relative to a waste fuels operations plant, a resin mold facility, and an experimental bio-mass reactor.

Significantly, he also supported Department of Energy nuclear weapons facilities at Savannah River, Hanford and the Rocky Flats Environmental Technology site. Some of his work performed at these sites include: performing a pre-startup process fire hazard analysis for the radioactive waste repack facility; developed a pilot study risk-based maintenance of fire protection systems; conducted safety analyses and safety level calculations for the consolidated incinerator facility; developed the conceptual design and cost analysis for a controlled atmosphere system for 177 high-level waste tanks; and, conducted fire protection assessments on multiple buildings.

1994-1996 --- Chemical Engineer, Gasser Associates, Inc. Aiken, SC

Dr. Schemel was a member of the Fire Hazards Analysis Team supporting work performed at the Department of Energy’s Savannah River Site. He performed general chemical engineering activities as well as process and control system analyses. He routinely performed fire safety calculations and analyses in support of both nuclear and other site facilities and operations.

Academic

- Ph.D., School of Engineering and Electronics, Building Research Establishment Center for Fire Safety Engineering, University of Edinburgh, Edinburgh, Scotland, 2008
- M.S., Chemical Engineering, University of South Florida, Tampa, Florida, 1994
- B.S., Chemical Engineering, University of South Florida 1992
- B.A., Social and Behavioral Sciences, University of South Florida 1987

Instructorships

Saudi Aramco, Dammam, Saudi Arabia --- Subject Matter Expert

- Fire Protection
- Loss Prevention Engineering
- Fire Dynamics
Curriculum Vitae
Christopher F. Schemel, Ph.D.
Page 3 of 4

- Quantitative & Qualitative Risk Assessment
- Hazard Analysis

Professional Affiliations

Senior Member, American Institute of Chemical Engineers
Member, Society of Fire Protection Engineers
Member, International Association of Wildland Fire
National Fire Protection Association

Professional Development

University of Edinburgh and Institute of Fire Engineers, Fire Investigation, Certified Fire Investigator, 2006
University of Edinburgh, Enclosure Fire Dynamics, 2006
American Institute of Chemical Engineers Center for Chemical Process Safety, Evaluation of Vapor Cloud Explosion Hazards, 1997

Publications & Presentations


**Patents**

System for Vaporization of Liquid Fuels for Combustion and Method of Use, U.S. Patent number 7,089,745

System for Vaporization of Liquid Fuels for Combustion and Method of Use, U.S. Patent number 7,322,198

Method and Apparatus for Indicating Activation of a Smoke Detector Alarm, U.S. Patent number 7,015,807
APPENDIX C
APPENDIX C

Comparison of Gas and Dust Explosions

Coal dust and methane/natural gas explosions have been studied in great detail for over a century in the United States and in a number of other countries throughout the world. The establishment of the Bureau of Mines greatly furthered these efforts within the United States. Experimentation within the United States to characterize gas and dust explosions in underground coal mines has been primarily performed in the controlled environments of dedicated test mines in Appalachia. Many of the experimental mines utilize geometries with high length/diameter (“L/D”) ratios, in an effort to resemble coal mine conditions. The relevant body of literature identifies numerous well-documented differences between coal dust and methane/natural gas explosions. Theoretically, both can achieve similar peak pressures, however in practice the range of explosibility of coal dust is significantly broader and does not share the characteristic pressure-concentration curve that is observed in methane/natural gas explosions. More specifically, coal dust does not appear to have an effective upper explosive limit.

Gas Explosions

The extent of a gas/vapor cloud explosion is governed by the region of gas that falls within its upper and lower flammable limits, UFL and LFL, respectively. Gases in concentrations that lie outside of their flammable range will not combust. Because a “rich” mixture can be easily diluted to concentrations within the flammable range, the only safe concentrations are those less than the LFL. Natural gas is composed largely of methane and ethane with trace quantities of other hydrocarbons. Depending on the exact mixture of the gas, the upper and lower flammability limits will change, however the approximate range for natural gas mirrors that of methane (its largest constituent) with a lower flammability limit of ~5% and an upper flammability limit of ~15% (Bjerketvedt, Bakke, & van Wingerden, 1997).

Coal Dust Explosions

Coal dust explosions are similar to other types of combustion processes in that the combustion reaction takes place in the gaseous phase. In order for combustion to occur the coal dust must devolatilize (i.e., flammable gases must be driven off of the solid particles). Once sufficient devolatization has occurred the reaction is able to propagate. The rate of devolatization is the limiting factor in the combustion of coal dust, which means until sufficient fuel has volatized the reaction cannot proceed.

The minimum explosive concentration (“MEC”) of coal dust has been studied by a number of authors and is summarized in Eckhoff (Eckhoff, 2003). Though there is variation based on particle size, the lowest MEC reported is approximately 35 g/m³, though Cashdollar and others report values closer to 70 g/m³. These differences are likely based on differing experimental setups. Cashdollar has indicated that there is a maximum concentration of coal dust at which point an increasing concentration does not correspond to a rise in pressure or reaction rate (Cashdollar, 1996).

It is important to note that when the MEC for coal dust is reached the “cloud” is optically thick, sufficiently so such that it is difficult to see through a dust cloud that is within the flammable range. As an example, Eckhoff indicates that a 40 g/m³ concentration of coal dust is so dense that it will make a 25 watt bulb almost impossible to see (Eckhoff, 2003). Typically, any dust concentrations observed in working environments are three to four orders of magnitude less than the MEC, such
that dust explosions primarily occur inside equipment where the concentration can be significantly higher without causing discomfort to individuals.

Gas Explosions v. Coal Dust Explosions

The overpressures achievable in methane/natural gas and coal dust explosions as functions of concentration are compared in Figure 1 (Cashdollar, 1996).

![Figure 1: Concentration of coal dust and methane gas v. pressure rise (Cashdollar, 1996)](image)

The peak pressure typically corresponds to approximately 5 times the stoichiometric dust concentration, regardless of the coal type. Researchers have also observed that the burnout time of the average coal particle is significantly longer than the characteristic explosion time (Continillo, Crescitelli, Fumo, Napolitano, & Russo, 1991).

Though somewhat dated, perhaps the most complete analysis of similarities and differences of gas and coal dust explosions was conducted in the mid-1970s, when researchers illustrated how pressure increases as the explosion wave propagates away from the face for both types of explosions. These trends are shown in Figure 2 and Figure 3 with details of the flame location, pressure profile, and timing. For testing, a 30-foot section was filled with a stoichiometric mixture of gas then ignited. The peak observed pressure for the gas explosion was approximately 20 psi at approximately 300 feet from the face (Richmond, 1975).
Figure 2 illustrates how both the flame and pressure fronts extend significantly beyond the area of the initial combustible gas region, however the pressure extends far greater than the flame front. This follows given the expansion of the gas as it is heated into the unburned gases ahead. The pressure continues to spread for a period of time after the flame has extinguished, and the pressure wave extends approximately 10 times the initial volume (very close to that estimated by the ideal gas law). The flame front extends approximately 4 times the initial fill volume.

Figure 3 shows how the flame and pressure fronts extend during a moderate coal dust explosion (Richmond, 1975).
Fischer’s (Fischer, 1957) experiments showed that very high pressures were obtained in the coal dust explosion, peaks in excess of 5 bar (72.5 psi) at the exit, and that pressures closer to the ignition source were likely much higher but the equipment was all destroyed.
APPENDIX D
APPENDIX D

Areas of UBB Ruled Out as Explosion Origin

Based on analysis of the explosion pathways, Massey’s investigation has revealed that the following sections of the mine were not the point of origin of the April 5, 2010 explosion:

- **Longwall Panel 21**
  The longwall section has two sets of damage from force, both the result of relatively low overpressure. First, the area of the longwall near the tailgate, including shield 176 and the tail drive, show explosion effects that indicate force coming from the Tailgate 21 entries. This includes prop setter butts imbedded in the top of Shield 176. In addition, a cover plate from the tail drive was tossed up the longwall over one hundred feet. Second, a force that came down the longwall from the headgate entry appears to have been from the final blow down phase of the mine, after the initial pressure rise. Thermal damage was noticeably absent along much of the longwall. A number of thermally sensitive items had little, if any, thermal damage, including paper, insulation on electrical cables, and plastic labeling on electrical boxes. The force and thermal damage on the longwall (or lack thereof) is not indicative of the force path or the heat footprint of an ignition. These observations are consistent with ignition and propagation of the explosion from the Tailgate 21 entries.

- **21 Crossover**
  The damage patterns in Tailgate 21 do not indicate an explosion propagating out from the 21 Crossover. Ignition in the 21 Crossover would not have displaced unburned gas into the North Glory Main just east of the 21 Crossover where the blast pressures were highest. Rather, the damage indicators are consistent with a flame propagating from west to east in 21 Crossover.

- **Headgate 22**
  Damage patterns in all the entries in Headgate 22 indicate a blast wave travelling inby, towards its working face. Additionally, the damage patterns in the North Glory Mains and 22 Crossover are not consistent with an explosion seat in Headgate 22.

- **Tailgate 22**
  The pattern of damage on Tailgate 22 indicates that it was caused by a blast wave travelling inby towards the working face. No patterns indicating a divergence in the forces were observed in this section. Moreover, the damage patterns in Headgate 21 are not consistent with an explosion starting in Tailgate 22.

- **22 Crossover**
  The damage pattern in 22 Crossover indicates that a blast wave travelled from south to north in this section. No patterns indicating a divergence in the forces were observed in the 22 Crossover. Had the explosion ignited and propagated from this area, a divergence in the damage patterns would have been observed. The damage patterns in Tailgate 22 and Headgate 21 are inconsistent with an explosion starting in 22 Crossover.
▪ Old North Parallel Mains

Damage appears to have been caused by a blast wave flowing from west to east, with its intensity decreasing rapidly in these entries. Had the explosion ignited and propagated from this area, a divergence in the damage patterns would have been observed, and the area affected by the blast would have been located further outby. The only survivors of this accident were in this section in the track entry at 67 Break.

▪ North Parallel Mains

There is evidence of damage caused by a blast wave flowing from west to east, with its intensity decreasing rapidly in these entries. Had the explosion ignited and propagated out from these entries, a divergence in the damage patterns would have been observed, and the area affected by the blast would have been located further outby.

▪ North Glory Mains

Damage patterns indicate a divergence in the pathway of the overpressure wave at the intersection with 21 Crossover. Therefore, an overpressure wave came from 21 Crossover and propagated out into the North Glory Mains.

▪ Glory Hole Section

The damage in the North Glory Mains and North Jarrells Mains is not consistent with an explosion being initiated in the Glory Hole Section. It is likely that the damage in this section was caused by a combination of the main overpressure wave and a reflective wave coming from North Jarrells Mains.

▪ North and West Jarrells Mains

The damage patterns in the North Glory Mains are not consistent with an explosion starting in these entries. Damage patterns in the North and West Jarrells Mains indicate an overpressure wave travelling inby towards the West Jarrells Mains.
APPENDIX E
APPENDIX E
Dispersion of Dust in a Coal Mine Explosion

For a coal dust explosion to propagate, the initial explosion, whatever the cause, must be sufficient to lift and suspend the dust ahead of the explosion wave so that the reaction may continue. Several facts are clear from the extensive research that has examined the dust lifting process (Fedorov, Fedorova, Fedorchenko, & Fomin, 2002), (Kosinski, Christian Hoffmann, & Klemens, 2005), (Gerrard, 1963), (Witt & Carey, 2002):

- Moisture plays a key role in dust’s ability to be lifted. Dust above approximately 9% moisture content will not be lifted regardless of the velocity within the tested range (8-13 m/s). (Smitham, 1991). Below 9% moisture content, the quantity of dust lifted is highly dependent on the particle size and moisture content.

- The pressures required to generate dust lifting in experimental conditions are significant, as are the shockwave velocities. Even in tests with a 450 m/s shockwave, dust above the minimum explosive concentration was only lifted ~8cm from the deposit surface (Zydak & Klemens, 2007).

- In full scale testing, where the explosion is typically initiated by a slug of methane, and the ensuing dust explosion was able to propagate, the overpressures were significant enough that pressure transducers and other equipment were damaged and observed pressures at the exit exceeded 5 bar or 72.5 psi (Fischer, 1957).

In all of the laboratory experiments, coal or other dust was tested in isolation, however, the dust lifting process does not discriminate based on the type of dust per se but is governed by density, particle diameter, and moisture content. Therefore one of the purposes of rock dusting is to ensure that all the coal dust is covered so that, in the event of an explosion, the rock dust is lifted and the coal dust does not participate in the explosion.

Kenneth Cashdollar and others have authored studies on post-explosion coke sampling of coal, as well as pre- and post-dust loading. Even over a small test area (dust loading over 130 m), dust will be deposited a significant distance away following an explosion. In Cashdollar’s testing, significant quantities of dust were relocated 100m beyond the initial dust location (~74% of the original dust loading length). Therefore, when an explosion occurs, significant relocation of dust will occur.

Examination of the dust loading pre- and post-explosion shows that the dust will be pushed a significant distance outside of the original containment area during an explosion event. Thus both rock dust and coal dust will be relocated from the area in which the explosion took place. Figure 1 compares the pre- and post-explosion distributions of dust.
Moreover, Cashdollar and others proved that coking can be found in samples of dust taken post-incident, even when the initial incombustible content of the dust was 80%. (Cashdollar, Weiss, Montgomery, & Going, 2007). The original composition of dust pre-explosion cannot be determined accurately from analysis after the incident due to the turbulence and forces that may affect the composition of the dust. (Nagy & Mitchell, 1963), (MSHA Report of Investigation, Sago Mine Explosion, 2007), (Sec'y of Labor v. Jim Walters Res., Inc., 27 FMSHRC 757, 805 (2005) (ALJ)).
APPENDIX F
APPENDIX F

3D Laser Scanning Technology Utilized by Performance at UBB

To capture and preserve a high level of detail in the underground accident investigation site, Performance employed 3D laser scanning equipment. The benefits of the 3D laser scanning are numerous. The accuracy, speed, and versatility of this sophisticated mapping technique are unparalleled. It offers accuracy within 0.005 feet and is effective measuring items as small as a pencil and as large as the massive longwall apparatus. The 3D laser scanner is also able to recognize color contrast. As evidenced by the photograph attached below, spray paint on the ceiling of the mine is apparent, as is the number “16” painted in yellow on the longwall shear. The laser scanner collects approximately 3 million data points per minute and, unlike the other common mapping techniques, effectively eliminates inaccuracies. Moreover, the 3D laser scanner, as opposed to other methods, offered an entirely non-intrusive measurement method that did not disturb or destroy the accident environment.

This photograph is a three-dimensional view of the longwall at UBB, including the shearer, which is on the far right of the photograph. The 3D scan is taken outby the longwall in the No. 7 entry. Timbers put in to support the roof can be seen, as well as a number of metal sand jacks, many of which were put in place to allow for the accident investigation. A portion of the crack in the floor, a possible source of the natural gas inundation, can be seen towards the bottom of the shear.
The 3D laser scanner gathered evidence that could not have been preserved through less-advanced methods such as photography or hand measurements. Scanning the mine was just the first step in producing invaluable information needed for accident reconstruction. Since the scanner is a line of site measuring tool, multiple scans were taken from different locations and aligned to provide full view of every object in the accident investigation site. Once millions of individual data points were aligned, they were extracted utilizing specialized software. The scans were then converted into 3D models of different sections within the mine. These 3D models were used to generate, among other things, a “fly thru” of the mapped area, essentially simulating a walk through the mine. This 3D capability allowed experts in fire and explosion dynamics to determine the pattern of debris dispersion caused by the explosion at UBB and could possibly be converted to 3D polylines and exported into CAD programs or used in finite analysis modeling.

MSHA traditionally maps its mine accident investigations using rudimentary hand-drawn maps that, even when exceptional care is used, are only accurate within half of a foot. Prior to the start of MSHA’s underground investigation in June 2010, Performance encouraged MSHA to map the mine using 3D laser scanning equipment, even offering to cover the substantial cost of the project. MSHA declined this offer and instead relied upon its archaic, unreliable method. The 3D scanning was not completed until Performance was given the opportunity to conduct its own investigation.
APPENDIX G
April 29, 2011

Mr. Daniel R. Petrole  
Acting Inspector General  
United States Department of Labor  
200 Constitution Avenue, N.W.  
Room S-5502  
Washington, D.C. 20210

Re: Performance Coal Company’s Complaint of Witness Intimidation, Abuse of Authority, and Obstruction of Justice by Department of Labor Officials

Dear Mr. Petrole:

This letter constitutes Performance Coal Company’s (“Performance”) formal complaint regarding the blatant misconduct of MSHA Chief Investigator Norman G. Page in the course of the government’s investigation of the Upper Big Branch mine tragedy. As explained in greater detail below, Mr. Page has knowingly obstructed a search for the truth by (1) repeatedly ordering the withdrawal of Performance’s scientific experts from the mine without a good faith basis; (2) attempting to intimidate Performance’s experts with retaliatory citations and orders; and (3) orchestrating a closed-door confrontation of a counsel-retained expert in which Mr. Page unambiguously threatened future retaliatory orders against the expert—in this investigation and any others—in an attempt to influence the expert’s work product and opinions. Performance presents this complaint to the Office of Inspector General because the Solicitor of Labor, M. Patricia Smith, has failed to perform an adequate investigation of Mr. Page, preferring instead to overlook wrongdoing to which he has essentially admitted. It is, therefore, left to the Inspector General to conduct a formal investigation of this serious misconduct.

I. Relevant Facts

A. Background

Performance owns and operates the Upper Big Branch mine (“UBB”), an underground coal mine in Montcoal, Raleigh County, West Virginia. MSHA administers the provisions of the Federal Mine Safety and Health Act and regulations promulgated thereunder, see 30 U.S.C. § 801, et seq., to improve safety and health standards in mining. As part of MSHA’s mandate, the agency investigates most mining accidents, including all mining fatalities. See id. § 813. To meet its
Mr. Daniel R. Petrole  
April 29, 2011  
Page 2

Objectives, MSHA has organized the country into 11 distinct Coal Mine Safety and Health Districts. UBB falls under the purview of District 4.

On April 5, 2010, an explosion at UBB killed twenty-nine miners. Within hours of this tragedy, MSHA issued an order under Section 103(k) of the Mine Act, 30 U.S.C. § 813(k) (Order No. 4642503), seizing control of the mine. (Attachment 1) After a rescue and recovery effort that included MSHA, the State of West Virginia, Performance, and rescuers from numerous other mine operators, MSHA began preparations for its investigation into the explosion. The Secretary of Labor appointed Norman Page to lead MSHA’s investigation team, in part, because as the District Manager for District 6 he was not directly affiliated with those who normally oversaw UBB and whose oversight of the mine would have to be scrutinized. See MSHA News Release, MSHA Appoints Team to Investigate Upper Big Branch South Mine Explosion (April 7, 2010) (Attachment 2). While Mr. Page, in his role as District 6 Manager, did not have regulatory oversight of Performance or UBB, he has supervised a number of mines operated by Massey Energy Company, Performance’s parent corporation.

MSHA's investigation of the UBB accident has consisted primarily of an underground investigation and witness interviews. Mr. Page has run both aspects secretively, excluding the victims’ families, Performance and the public from any meaningful participation. With respect to the underground investigation, Mr. Page permitted only a single Performance representative to observe MSHA’s investigation teams and, although Performance has a statutory obligation to conduct its own independent investigation, MSHA specifically precluded Performance from using photography or electronic mine mapping to preserve critical evidence and even attempted to coerce the company into destroying evidence by applying rock dust or water to areas still under investigation. With respect to formal witness interviews, Mr. Page has excluded Performance from the overwhelming majority, allowing company counsel to attend only interviews of witnesses deemed by MSHA to be corporate “control persons.” Mr. Page also ignored repeated complaints from counsel—on behalf of the company and numerous individuals—that MSHA lured witnesses to interviews under false pretenses, intimidated witnesses with hostile questioning, and denied witnesses an opportunity to review or correct interview transcripts. In retrospect, the hostility directed at these witnesses presaged Mr. Page’s abuse of Performance’s experts.¹

B. First Interference With—and Intimidation of—Performance’s Experts

The complexity and scope of the UBB accident required Performance and MSHA to retain and consult experts in fire and explosion dynamics, geology, and other scientific disciplines. At a

¹ There is a long history of correspondence exchanged between Performance and MSHA documenting these events, which Performance would be happy to share.
Mr. Daniel R. Petrole  
April 29, 2011  
Page 3

minimum, certain experts needed to view the accident site in order to contribute meaningfully to the investigation. As you know, expert participation in mining accident investigations is a longstanding, generally accepted practice and is not unique to the UBB accident investigation. See, e.g., Sec'y of Labor v. Jim Walter Resources, 27 FMSHRC 757 (A.L.J. Nov. 1, 2005). From the beginning, however, Mr. Page has attempted to obstruct Performance’s experts by preventing them from using modern technology, by repeatedly excluding them from the mine, and by issuing retaliatory citations and orders.

The interference with—and intimidation of—Performance’s experts began in earnest on October 7, 2010, when MSHA issued an unprecedented Section 104(a) citation (No. 8249951) against Performance and a Section 104(q)(1) order (No. 8249950) against Dr. Christopher Schmel, a consulting expert retained by Performance’s counsel in its internal investigation. (Attachments 3, 4) With that order, MSHA denied Dr. Schmel access to UBB, ostensibly for not having received forty hours of “new miner” training. The frivolous nature of the order was plain: Not only is Dr. Schmel a scientist and not a miner, he was not conceivably “working” in the mine within the meaning of the regulation. See 30 C.F.R. § 48.2(a)(1)-(2). Since the start of the investigation over three months prior to the order, MSHA permitted Dr. Schmel only to accompany MSHA underground as an observer, which obviously did not trigger any training requirement. See Sec’y of Labor, Mine Safety and Health Admin. v. SCP Invs., LLC, 31 FMSHRC 821 (Comm’n Aug. 10, 2009). As outlined in a letter sent to the Office of the Solicitor the following day, the citation and order were an unprecedented and unlawful attempt to exclude Performance’s lead scientific expert on the eve of its independent investigation and threatened Performance’s constitutionally guaranteed access to evidence. See Letter from Benjamin D. Wood to Derek J. Baxter and Matthew N. Babington (Oct. 8, 2010) (Attachment 5).

One week later, MSHA finally permitted Performance to begin its own independent investigation, though still under restrictive protocols incorporated into the Section 103(k) control order (Order No. 4642503). Performance’s investigation and those of MSHA and the West Virginia Office of Miners’ Health Safety & Training are ongoing.

C. February 14, 2011 Safety Incident and Mr. Page’s Continued Retaliation, Intimidation, and Obstruction of Performance’s Experts

On February 14, 2011, United Mine Workers of America (“UMWA”) agent Leon Moscalink, functioning as a miners’ representative under the Mine Act, accompanied Performance’s accident investigation team and MSHA inspector Randall Lewis underground. As the team examined a shield hauler and charging station in the mine, Mr. Moscalink used a slate bar to dislodge a piece of rock measuring approximately 3’ x 5’ x 2” from the mine roof. The rock fell directly onto the shield hauler and charging station, damaging these important pieces of evidence and endangering the safety of the investigation team. Mr. Moscalink ignored the repeated pleas of Dr. Pedro Reszka—Performance’s scientific expert and colleague of Dr. Schmel’s at Delta Q Fire &
Mr. Daniel R. Petrole  
April 29, 2011  
Page 4

Explosion Consultants, Inc. ("Delta Q")—to cease scaling rock from the roof directly above team members. Instead, Mr. Moscalink berated Dr. Reszka for expressing concerns about team members’ safety and the potential loss of important evidence. He eventually stopped scaling rock hanging directly above the investigation team, but continued to do so in other parts of the mine.

Concerned about Mr. Moscalink’s reckless and potentially hazardous actions, I contacted Matthew N. Babington, Esq. of the Office of the Solicitor on February 16. I expressed my concerns about Mr. Moscalink’s behavior and requested that MSHA take appropriate action, including termination of Mr. Moscalink as a miners’ representative. Mr. Babington agreed to look into the incident. Less than twenty-four hours later, however, MSHA issued an astounding order and citation against Delta Q and Performance (Order No. 8405518, Citation No. 8405519) and not against Mr. Moscalink, alleging that Dr. Reszka failed to recognize mine hazards and ordering his removal from the mine pending further training. (Attachments 6, 7) On learning of this appalling abuse of authority, I informed Mr. Babington, who conceded that “the complaint from yesterday started the discussion” that culminated in the action taken against Dr. Reszka and Performance, essentially admitting that MSHA had retaliated against Dr. Reszka for advising MSHA about Moscalink’s hazardous behavior. After further consultations, the Office of the Solicitor, recognizing the obviously retaliatory nature of those actions, agreed to vacate both the order and citation (Order Nos. 8405518-02, 8405519-02).

Undeterred by the rebuke of his own counsel, Mr. Page chose to escalate hostilities by demanding a meeting with Dr. Schemel and two Performance employees, Wayne Persinger and Chris Prater, ostensibly to discuss vacatur of the retaliatory order and citation. When the parties assembled the following morning at UBB, however, Mr. Page unexpectedly excluded the Performance employees from the conference room and bore down on Dr. Schemel in private. Notably, if MSHA had sought a witness interview of Dr. Schemel at the National Mine Academy, Performance’s counsel, who retained Dr. Schemel to conduct a privileged investigation in preparation for possible litigation, obviously would have rejected the request. Consequently, Mr. Page’s sequestration of Dr. Schemel improperly circumvented Performance’s attorney-client privilege and work product protections. His use of a citation conference as a guise to force a retained expert into a secret interview is, therefore, grounds for discipline independent of his subsequent misconduct.

Having cornered Dr. Schemel under false pretenses, Mr. Page aggressively attempted to obstruct Dr. Schemel from fully participating in Performance’s investigation of the UBB accident. Mr. Page stated that although Performance and Delta Q had retained counsel and the Office of the Solicitor had vacated the citation and order, such agreements meant nothing underground, where Mr. Page was in charge. Mr. Page expressed anger that Department officials agreed to vacate his order without consulting him. He then bluntly explained that Delta Q and Dr. Schemel had two options: They could continue to insist that Mr. Page honor the government’s agreement to vacate the order or, as Mr. Page preferred, they could allow him to convert the removal order to
Mr. Daniel R. Petrole  
April 29, 2011  
Page 5

a citation, direct Dr. Reszka to complete additional training, and terminate the citation afterward. Mr. Page also warned that if Performance and Delta Q continued to rely upon the agreement reached by their “Washington lawyers,” he would have UMWA and MSHA representatives scour Performance’s investigative notes, photographs and videos for evidence to support retroactive citations against Delta Q, Dr. Schemel, Dr. Reszka, and Performance. In other words, the consequence of rectifying the original retaliation would be greater retaliation. To demonstrate the sincerity of his threats, Mr. Page showed Dr. Schemel photographs of Performance and Delta Q investigation team members working in the mine under what Mr. Page mischaracterized as unsafe conditions that would be the basis for retaliatory retrospective citations.

After attempting to undermine the agreement reached by his own attorneys, Mr. Page then attacked Dr. Schemel’s role in the investigation and attempted to influence his conclusions and work product. Mr. Page repeatedly asked Dr. Schemel what his “intent” or “purpose” was, alleged that Performance’s only purpose was to discredit MSHA, and suggested that Dr. Schemel would have to manipulate data and violate ethical rules in order to reach conclusions that differed from those of MSHA. Mr. Page then ended the confrontation with a threat to Dr. Schemel’s livelihood, warning that MSHA and the UMWA could similarly target him on future mine projects anywhere in the United States, effectively making it impossible for Dr. Schemel to work in the mine industry. The deliberate reference to the UMWA—and by implication, the unfortunate history of violence in the coal fields—left Dr. Schemel concerned about his physical safety and prompted him to explore retaining guards to protect his family and himself.

Though MSHA does not appear to dispute the above facts, it is important to note that Mr. Page himself corroborated the above account. Immediately after his hour-long inquisition of Dr. Schemel, Mr. Page and MSHA agents Tim Watkins and Jasey Maggard visited Performance’s investigation headquarters and repeated to Performance employees many of the same threats. Specifically, Mr. Page emphasized that it would be in the company’s interest to agree to allow Mr. Page to change the Reszka removal order to a citation because vacatur of the order would result in the issuance of numerous additional citations. Mr. Page then reiterated these same threats during a February 20 phone conversation with Performance employee Chris Prater, who nevertheless informed him that Delta Q and Performance would insist on MSHA’s adherence to the Solicitor’s agreement to vacate the citation and order. Mr. Page concluded this episode with one final phone call on February 24, in which he repeated those threats and also suggested to a Performance employee that the company should not rely upon its counsel and admitted what Performance tentatively assumed, namely, that he does not always follow the advice of the Solicitor.

D. Performance’s Response and Further Retaliation from Mr. Page

On February 18, minutes after learning of Mr. Page’s confrontation with Dr. Schemel earlier in the morning, I again contacted Mr. Babington of the Solicitor’s Office and specifically
Mr. Daniel R. Petrole  
April 29, 2011  
Page 6

complained about Mr. Page’s dramatic escalation of abusive conduct. Mr. Babington informed me later that afternoon, after consulting with Mr. Page, that Mr. Page intended to honor the agreement on vacatur, but that the Solicitor’s Office could not prevent him from issuing retroactive citations relating to the UMWA’s review of investigation notes, videos, and photos.

On February 24, however, Mr. Page struck again, ordering Performance immediately to withdraw from the mine yet another counsel-retained scientific expert, John Montoya, Jr., of Baker Engineering and Risk Consultants, Inc. (“Baker Risk”). The order flew in the face of a longstanding agreement between MSHA and Performance to permit any member of the investigation team who would not spend more than five days underground to attend five hours of safety training rather than forty hours of “new miner” training. Mr. Montoya had completed the required five-hour training and was about to enter the mine for his fifth day of investigation when MSHA obstructed his entry on the frivolous ground that that Mr. Montoya’s underground training counted as a day worked, which meant that Mr. Montoya had exhausted his five allotted days. MSHA’s tortured interpretation was nothing more than a fulfillment of Mr. Page’s prior pledge to retaliate against Performance for insisting on Mr. Page’s adherence to the Solicitor’s agreement to vacate the Reszka order and citation.

On the afternoon of February 24, I spoke with Derek Baxter, Esq. of the Solicitor’s Office to relay the full details of Mr. Page’s continuing misconduct. Within an hour of that telephone conversation, Mr. Page called Mr. Prater to advise him that Mr. Montoya’s ouster was the first of much more “paperwork” resulting from the failure of Performance to cave in to his demands on the Reszka matter. Having obviously heard from Mr. Baxter that his misconduct had been exposed, Mr. Page also threatened that if Performance “took action” to oppose him then he would reinstate the recently vacated Reszka order and citation.

That very same afternoon, Mr. Page’s subordinates in District 6 hastily scheduled an inspection of Massey’s Southern West Virginia Mine Rescue station, located adjacent to UBB. Not coincidentally, the captain of that mine rescue team, Rob Asbury, was with Dr. Reszka on the day that they witnessed the unsafe practices of the miners’ representative, Mr. Moscalink, which led to the retaliation described above. This purported “inspection” was obviously a further effort at retaliation and intimidation; there is no legitimate reason for District 6 employees to inspect a District 4 mine rescue station located outside of their jurisdiction. Indeed, that same mine rescue station already had been audited several times after the UBB accident by District 4 inspectors, who gave the unit high marks. MSHA immediately cancelled this bogus “inspection” once I notified the Office of the Solicitor, which no doubt recognized it as retaliatory.

E. The Solicitor of Labor’s Failure to Conduct an Adequate Investigation

After informing the Solicitor’s Office on February 24 of Mr. Page’s ongoing misconduct, Robert Luskin and I also reported his actions to Steven Ruby, the Assistant United States Attorney for
Mr. Daniel R. Petrole  
April 29, 2011  
Page 7

the Southern District of West Virginia who leads the grand jury investigation of the UBB accident. That same evening, Mr. Baxter assured me that our complaints were being investigated “at the highest levels.” I would note that during subsequent conversations with Messrs. Baxter and Babington, the Solicitor’s Office never disputed the facts underlying Performance’s complaints.

On March 30, I received a call from the Solicitor of Labor, Patricia Smith, who explained that, although Performance’s recitation of the facts was materially correct, she had concluded that Mr. Page had “no intent to intimidate” Dr. Schemel or other witnesses and that the string of questionable orders and citations were not retaliatory. These were startling conclusions in light of her concession that Mr. Page admitted asking Dr. Schemel whether his work product was intended to uncover the truth or rather to discredit MSHA—as if the two were mutually exclusive—and admitted accusing Dr. Schemel of manipulating data and acting unethically. Ms. Smith explained that two MSHA inspectors claimed to have overheard Dr. Schemel say that he could discredit MSHA’s theory of the explosion, as if that somehow justified Mr. Page’s hostility toward Dr. Schemel. Indeed, even if Dr. Schemel had made such a comment—which he did not—Mr. Page’s knowing attempt to alter Dr. Schemel’s conclusions would be more unlawful, not less. As to Mr. Page’s outlandish threat to Dr. Schemel’s livelihood, Ms. Smith credited Mr. Page’s contention that he had only mentioned UMWA (not MSHA) retaliation against Dr. Schemel and Delta Q, which is not only false, but even on its own terms hardly comforting to the targets.

Though Ms. Smith repeatedly assured me that her investigation was thorough, she admitted that she had spoken only to Mr. Page, a UMWA official and the two MSHA inspectors who had accompanied Dr. Schemel. The Solicitor’s Office never sought to interview Dr. Schemel or any Performance representative. Ms. Smith also showed no willingness to consider the long list of corroborating and confirming witness statements detailed above. Solicitor Smith only conceded the obvious fact that it was “inappropriate” for Mr. Page to meet privately with a consulting expert retained by Performance’s counsel, regardless of what was discussed. Solicitor Smith concluded the call by advising me that Mr. Page would remain in charge of MSHA’s investigation, but with her assurance that he would not repeat such inappropriate behavior.

Solicitor Smith’s faith in Mr. Page was misplaced. Just two days later, on April 1, Mr. Page sent a letter to Dr. Schemel and Mr. Prater asking them to attend another meeting with MSHA and the UMWA to discuss the vacated order and citation against Delta Q and Performance involving Dr. Reszka. (Attachment 8) Several days later, Mr. Page’s investigation team even demanded the original documents for all of Dr. Reszka’s training records. Mr. Page’s continued and conspicuous attention to this subject proves again his determination to obstruct and intimidate Performance’s experts, despite Ms. Smith’s assurances to the contrary.
Mr. Daniel R. Petrole  
April 29, 2011  
Page 8

II. Mr. Page’s Conduct Is Improper and Unlawful

Because the Office of the Solicitor has demonstrated an inability or unwillingness to constrain Mr. Page, Performance asks the Office of Inspector General to exercise its authority under 5 U.S.C. App. 3 § 4(a)(1) to open a formal investigation of Mr. Page’s misconduct and to take appropriate disciplinary action to protect Performance and its experts from further violations of their rights. See Semiannual Report to Congress, Volumes 64, 65 (Apr. 1, 2010 – Sept. 30, 2010) (“The [Office of Inspector General] is charged with the responsibility for conducting investigations into possible misconduct or criminal activities involving DOL employees or individuals providing services to the Department.”).

First, Mr. Page’s conduct amounts to a violation of federal criminal law that warrants a referral by this office to the Attorney General. See 5 U.S.C. App. 3 § 4(c). As you know, it is a felony to “obstruct[], influence[], or impede[] any official proceeding, or attempt[] to do so.” 18 U.S.C. § 1512(c)(2). The federal grand jury currently investigating the UBB mine accident is one such “official proceeding.” See 18 U.S.C. § 1512(g)(1) (noting that grand jury investigation is “official proceeding” for purposes of witness intimidation statute). See also 18 U.S.C. § 1505 (federal crime to “corruptly, or by threats or force, or by any threatening letter or communication influence[], obstruct[], or impede[] or endeavor[] to influence, obstruct, or impede the due and proper administration of the law under which any pending proceeding is being had before any department of agency of the United States”); 18 U.S.C. § 1513(b)(1) (federal crime to “knowingly engage[] in any conduct and thereby cause[] bodily injury to another person or damage[] the tangible property of another person, or threaten[] to do so, with intent to retaliate against any person for the attendance of a witness or party at an official proceeding, or any testimony given or any record, document, or other object produced by a witness in an official proceeding”). Mr. Page’s blatant attempt to intimidate Dr. Schmel and to influence both his findings and his very willingness to participate as a defense expert violate federal criminal law. At a minimum, Mr. Page cannot be allowed to continue in his present position as chief accident investigator, where he is in position to interfere unlawfully with Performance’s independent investigation.

Second, Mr. Page’s misconduct violates Performance’s constitutional due process right to access evidence relevant to its defense without undue government interference. The Supreme Court consistently has held that the fundamental fairness element of due process includes a meaningful opportunity to present a full defense, and to safeguard that right the Court has developed “what might loosely be called the area of constitutionally guaranteed access to evidence,” which obligates the government to both preserve and grant access to defense evidence. California v. Trombetta, 467 U.S. 479, 485 (1984) (quotation omitted). Mr. Page has significantly infringed upon this right by obstructing Performance’s access to the accident site and by attempting to intimidate Performance’s experts from participating fully in the investigation. His abuse of authority also is the type of unconscionable government conduct that violates substantive due process. See, e.g., County of Sacramento v. Lewis, 523 U.S. 833, 846-47 (1998) (due process is violated...
where the agency’s abuse of power “shocks the conscience,” i.e., where its conduct does not “comport with traditional ideas of fair play and decency” or interferes with a right “implicit in the concept of ordered liberty.”). Mr. Page, therefore, can be held personally liable for grossly infringing upon Performance’s constitutional rights. See, e.g., Bivens v. Six Unknown Named Agents of Fed. Bureau of Narcotics, 403 U.S. 388 (1971); Okwedy v. Molinari, 333 F.3d 339, 344 (2d Cir. 2003).

Third, Section 105(c) of the Mine Act prohibits a mine operator from retaliating against any “miner, representative of miners, or applicant for employment in any coal or other mine” for reporting a safety violation. 30 U.S.C. § 815(c)(1). Yet Mr. Page, although responsible for the enforcement of this prohibition, issued retaliatory citations and orders precisely because Dr. Reszka raised safety concerns about a UMWA team member. See, e.g., 5 U.S.C. App. 3 § 7(a) (providing for investigation by inspectors general into allegations of “abuse of authority”). Mr. Page compounded that misconduct by threatening and issuing additional citations and orders against Performance and its experts for reporting the initial retaliation in an effort to shield his conduct from scrutiny. See, e.g., Administrative Investigation Misuse of Position, Abuse of Authority, and Prohibited Personnel Practices Office of Information & Technology Washington, DC, Dep’t of Veterans Affairs Office of Inspector General, Report No. 09-01123-195 (Aug. 18, 2009) (finding Veterans Affairs official abused her authority by influencing subordinates and third-party to further her personal goals).

Mr. Page’s pattern of threats, retaliation, and witness intimidation—all designed to impede and obstruct Performance’s defense of ongoing criminal and civil proceedings arising from the Upper Big Branch tragedy—requires a legitimate and unbiased investigation. I trust that the Inspector General will treat the issues raised above with the prompt and serious attention that they warrant. I may be reached at the number listed above should any questions arise.

Respectfully,

[Signature]

Benjamin D. Wood

cc: Robert D. Luskin, Esq.
Steven R. Ruby, Esq.
M. Patricia Smith, Esq.
Attachment 1
An accident occurred at this operation on 04/15/2014, at approximately 3:27 pm. This order is being issued, under the Federal Mine Safety and Health Act of 1977, Section 103(d), to prevent destruction of any evidence which would assist in investigating the cause or causes of the accident. It prohibits all activity in the underground areas of the mine except to rescue and rescue miners.
The initial order is modified to reflect that MSHA is now proceeding under the authority of Section 103(k) of the Federal Mine Safety and Health Act of 1977. This Section 103(k) order is intended to protect the safety of all persons on site, including those involved in rescue and recovery operations or investigation of the accident. The mine operator shall obtain prior approval from an Authorized Representative of the Secretary for all activities to remove and or restore operations in the affected area. Additionally, the mine operator is reminded of its existing obligations to prevent the destruction of evidence that would aid in investigating the cause or causes of the accident.

Section II, Item 12 is modified to 103(k).
Attachment 2
MSHA appoints team to investigate Upper Big Branch South Mine explosion

ARLINGTON, Va. – The U.S. Department of Labor’s Mine Safety and Health Administration has appointed a team to investigate the April 5 explosion at the Upper Big Branch South Mine (Performance Coal Co.) in Whitesville, W.Va.

“Twenty-five hardworking men died unnecessarily in a mine Monday,” said Secretary of Labor Hilda L. Solis. “The very best way we can honor them is to do our job. MSHA’s investigation team is committed to finding out what happened, and we will take action.”

“The investigation team will work tirelessly to evaluate all aspects of this accident to identify the cause of the disaster,” said Assistant Secretary of Labor for MSHA Joseph A. Main.

A team of MSHA mine safety professionals from outside the district responsible for enforcement at the Upper Big Branch South Mine will evaluate all aspects of the accident, including potential causes and the operator’s compliance with federal health and safety standards. A formal report to be issued by MSHA will summarize the findings and conclusions of the investigative team, identifying root causes of the accident and how the incident unfolded. Any contributing violations of federal mine safety standards that existed will be cited at the conclusion of the investigation.

The Upper Big Branch Accident Investigation Team is being led by Norman Page, district manager of MSHA’s District 6 in Pikeville, Ky. Page has held a number of positions in his 25-year career with the agency, including mine inspector, ventilation/roof specialist, ventilation supervisor, roof control supervisor and assistant district manager. Page has participated in numerous accident investigations.

Other team members from MSHA’s staff include Timothy Watkins, assistant district manager of District 6; Ben Harding, staff assistant of District 5 (Virginia); Erik Sherer, coal mine safety and health mining engineer from the headquarters office; Alvin Brown, program analyst of District 7 (Kentucky); Dave Steffey, mining engineer of District 6; Jerry Vance, educational field services specialist from Educational Policy and Development; and Jasey Maggard, electrical supervisor of District 7. Rich Stoltz, supervisory general engineer, Ventilation Division; Clete Stephan, general engineer, Ventilation Division; Tom Morley, mining engineer, Ventilation Division; and Sandin Phillipson, geologist, Roof Control Division in the agency’s Office of Technical Support also will assist in the investigation.

Additionally, Derek Baxter and Dana Ferguson, trial attorneys for the Labor Department’s Office of the Solicitor, are on the team.

MSHA’s mission is to administer the provisions of the Federal Mine Safety and Health Act of 1977, as amended by the Mine Improvement and New Emergency Response Act of 2006, and to enforce compliance with mandatory safety and health standards as a means to eliminate fatal accidents; to reduce the frequency and severity of nonfatal accidents; to minimize health hazards; and to promote improved safety and health conditions in the nation’s mines.

U.S. Department of Labor releases are accessible on the Internet at http://www.dol.gov. The information in this news release will be made available in alternate format (large print, Braille, audio tape or disc) from the COAST office upon request. Please specify which news release when placing your request at 202-693-7828 or TTY 202-693-7755. The Labor Department is committed to providing America’s employers and employees with easy access to understandable information on how to comply with its laws and regulations. For more information, please visit http://www.dol.gov/compliance.
Attachment 3
The operator has failed to ensure that a contractor consultant working underground at the mine has received the required comprehensive 40-hour new miner training prior to performing duties underground. The contractor has been working at the minesite for several months without the required training. The operator's failure to ensure the contractor had the required training has resulted in the issuance of a 104(g)(1) order being issued to the contractor (Packer Engineering CID. 1131).
Attachment 4
Chris Schemel, a contract employee for the operator, has not received the required 40-hour new miner training prior to performing duties underground at the mine site. Mr. Schemel has no previous mining experience. Mr. Schemel is hereby ordered to withdraw from the mine until he has received the required training. The Federal Mine Safety and Health Act of 1977 declares that an untrained miner is a hazard to himself and to others.
October 8, 2010

VIA EMAIL AND US MAIL

Mr. Derek J. Baxter, Esq.
Mr. Matthew N. Babington, Esq.
U.S. Department of Labor
Office of the Solicitor
Mine Safety and Health Division
1100 Wilson Blvd., 22nd Floor
Arlington, VA 22209

Re: New Miner Training Citation No. 8249951 and Order No. 8249950 Regarding Dr. Christopher Schemel

Dear Derek and Matt:

I write to follow up on our discussions yesterday concerning MSHA’s extraordinary decision to deny underground access at the Upper Big Branch mine to Performance Coal Company’s outside scientific consultant and investigator, Dr. Christopher Schemel, claiming that Dr. Schemel has not received the requisite forty hours of new coal miner training. You explained yesterday that MSHA, and specifically Norman Page, maintains the position that the frequency of Dr. Schemel’s investigation activities qualifies him as a “new miner” under the Mine Safety and Health Act.

Subsequent to our discussions, I received copies of an order and a citation MSHA issued in connection with this incident: a 104(g)(1) order to Dr. Schemel, ordering him “to withdraw from the mine until he has received the required training;” and a 104(a) citation to Performance for failing “to ensure that a contractor consultant working underground at the mine” had received the required new miner training. In the agency’s decades of accident investigations, we are unaware of a single prior instance in which MSHA cited an operator’s consulting scientific expert for lacking new miner training. Moreover, Dr. Schemel appears to have been unfairly singled out here, as MSHA has not required similar training for its own technical support personnel or for the out-of-state United Mine Workers of America (“UMWA”) miners’ representatives.

Even to a casual observer, the timing of this unprecedented exclusion of a scientific consultant to an accident investigation smacks of strategic abuse. MSHA’s forces and flames investigation team, which Dr. Schemel had accompanied underground for four months, had just announced the
previous day that it had completed its work. Accordingly, at the time he was cited Dr. Schemel was preparing to go underground with the investigation team from the West Virginia Office of Miners' Health, Safety and Training. This morning, we received Mr. Page's letter announcing that MSHA would modify the Section 103(k) Order to permit Performance to begin its own independent investigation in the UBB areas out by 83 break. Though we appreciate even this limited opportunity for Performance finally to have access to its mine, it is unconscionable that MSHA would take unprecedented and unlawful steps to exclude the company's lead scientific consultant on the eve of Performance's statutorily-mandated independent investigation. Unfortunately, this overreaching is consistent with the troubling pattern of MSHA consistently interfering with Performance's access to critical evidence in the UBB investigation.

Dr. Schemel's credentials as a renowned scientific consultant are impeccable, but more importantly solidify a common sense understanding that he is a scientist, not a miner. Dr. Schemel, a leading explosions expert with a Ph.D. in fire safety engineering from the University of Edinburgh, has previously served as an investigator on the 2001 West Pharmaceutical's explosion in Kinston, NC; the 2005 Buncefield Oil Storage explosion in Hertfordshire, England; the 2005 BP Texas City Refinery explosion in Texas City, Texas; the 2006 Sago Mine explosion in Sago, West Virginia; the 2009 ConAgra Foods explosion in Garner, NC; and the 2009 NDK Crystal explosion in Belvidere, IL. Dr. Schemel consulted on those investigations without incident, making his current exclusion all the more indefensible.

Even aside from the suspect timing and selective enforcement, and the questions of fundamental fairness and due process raised thereby, the purported legal basis for Dr. Schemel's exclusion is plainly flawed. The requirements for underground miner training and retraining are set forth in 30 C.F.R. Part 48. The regulations explicitly differentiate between the training requirements for any new miner who is working in an underground mine on production or construction or who is regularly exposed to mine hazards and the far less onerous hazard training requirements for a “scientific worker” working in the mine for a short-term purpose. Compare 30 C.F.R. § 48.2(a)(1) with 30 C.F.R. § 48.2(a)(2). A scientific worker subject to hazard training under Section 48.2(a)(2) is expressly excluded from the definition of miners required to complete the forty hours of new miner training under Section 48.2(a)(1). Dr. Schemel, who has received the hazard training that would be required of a scientific worker, is thus at a minimum excused from the regulatory requirement to obtain new miner training on that basis.

More fundamentally, however, Dr. Schemel is not “working” in the mine as a “miner” subject to the training requirements of either Sections 48.2(a)(1) or (a)(2). To date he merely has been accompanying MSHA and OMHST during their accident investigation. In fact, MSHA's own "Upper Big Branch Mine — South — Accident Investigation Protocols," issued May 24, 2010, explicitly state that the Performance representatives will only “accompany” the agencies' investigation teams. That investigation activity does not constitute “working” in a mine so as to
Derek Baxter, Esq.
Matthew Babington, Esq.
October 8, 2010
Page 3

Trigger the Part 48 training requirements in any way. In a 2009 decision issued under Part 46, an analog to Part 48, the Federal Mine Safety and Health Review Commission squarely addressed whether a mine operator's representative must have received new miner training in order to accompany an MSHA inspector during the physical inspection of any coal or other mine. See Secretary of Labor, Mine Safety and Health Administration v. SCP Investments, LLC, 31 FMSHRC 821, 16 MSHN 306 (Aug. 10, 2009). In SCP, upon learning that a quarry owner and his employees were not trained in accordance with the requirements in 30 C.F.R. Part 46, MSHA issued several training citations and orders, ordered all employees out of the pit, and refused to permit the owner to accompany the inspector during the inspection due to alleged lack of training. In the legal challenge to those orders and citations, the Commission concluded definitively:

Section 46.5 is not a proper basis for excluding Mr. Stone. Section 46.5 specifically refers to training which a new miner must have before he or she can "work" at a mine. ... [B]y its terms section 46.5 does not relate to inspections of the mine. This conclusion is supported by our case law, in which we have held that a non-miner may be a representative of miners and participate in an inspection under section 103(f). See, e.g., Emery Mining Corp., 10 FMSHRC 276 (Mar. 1988), aff'd in pertinent part and rev'd on other grounds sub. nom. Utah Power & Light Co. v. Sec'y of Labor, 897 F.2d 447 (10th Cir. 1990).

31 FMSHRC at 824. Under this Commission precedent, accompanying MSHA during an inspection or investigation does not constitute "work" for purposes of the regulatory training requirements. As with the representatives in SCP, in accompanying MSHA and OMHST in their accident investigation Dr. Schmel has not been "working" in UBB and thus is not required to receive new miner training under 30 C.F.R. § 48.2(a)(1).

In consideration of the foregoing, Performance respectfully requests that MSHA vacate immediately the 104(g) order issued to Dr. Schmel and the 104(a) citation issued to Performance yesterday. The order and citation are legally invalid, issued for an improper purpose, and threaten Performance's constitutionally guaranteed access to evidence.

Regards,

Benjamin D. Wood
Derek Baxter, Esq.
Matthew Babington, Esq.
October 8, 2010
Page 4

cc: Robert D. Luskin, Esq.
    Patrick J. Slevin, Esq.
    Peter S. Gould, Esq.
This order is issued to protect the health and safety of miners. Pedro Reszka has demonstrated that he cannot recognize hazards in the work areas of the underground mine. During MSHA representative's travels with Mr. Reszka, he has been warned of roof and other hazards repeatedly. Many times Mr. Reszka has shown an unwillingness to comply with warnings and requests. He continues to ignore ribbed off areas and loose roof even after the areas of loose roof have been pointed out to him by experienced miners several times. Records indicate that Mr. Reszka has received comprehensive training, it has been observed that the training has been ineffective for Mr. Reszka to recognize hazards and the avoidance of such hazards. He is hereby removed from all work areas of the mine until Mr. Reszka has been retrained according to the operator's approved training.

See Continuation Form (MSHA Form 7000-3a)
plan and he has demonstrated to the operator that all training received has been effective. Management of Performance Coal Company shall provide MSHA with a written statement that the training has been conducted and is effective. MSHA shall be notified when the training is to be conducted to have the opportunity to monitor the training.
Re-training has now been conducted with Pedro Reszka on 2-18-2011. The training was 4 hours of class room and 1 hour underground.
After consultation with SOL, it has been determined that this order should be vacated.
Attachment 7
Pedro Reszka has not been properly trained. Pedro Reszka has demonstrated that he can not recognize hazards in the work areas of the underground mine. During MSHA representative's travels with Mr. Reszka, he has been warned of roof and other hazards repeatedly. Many times Mr. Reszka has shown an unwillingness to comply with warnings and requests. He continues to ignore ribboned off areas and loose roof even after the areas of loose roof have been pointed out to him by experienced miners several times. Records indicate that Mr. Reszka has received comprehensive training, it has been observed that the training has been ineffective for Mr. Reszka to recognize hazards and the avoidance of such hazards. He is hereby removed from all work areas of the mine until Mr. Reszka has been retrained according to the operator's approved training plan and he has
demonstrated to the operator that all training received has been effective. Management of Performance Coal Company shall provide MSHA with a written statement that the training has been conducted and is effective.
Re-training has now been conducted with Pedro Reszka on 2-18-2011. The training was 4 hours of class room and 1 hour underground.
After consultation with SOL, it has been determined that this citation should be vacated.
Attachment 8
U.S. Department of Labor

Mine Safety and Health Administration
1301 Airport Road
Room D-200
Beaver, West Virginia 25813-9426

BY FAX

April 1, 2011

Chris Prater
Performance Coal Company
P.O. Box 69
Naoma, WV 25140
(304) 854-3412

Dr. Schemel
DQ Fire and Explosion Consultants, Inc.
c/o
Performance Coal Company
P.O. Box 69
Naoma, WV 25140
(304) 854-3412

Re: Upper Big Branch Mine
Conference on 104(a) Citation No. 8405519 and 104(g) Order No. 8405518

Dear Mr. Prater and Dr. Schemel:

Please be advised that the miners' representative, the United Mine Workers of America, wishes to discuss Section 104(a) Citation No. 8405519 and Order No. 8405518. We have scheduled this discussion to be held at a conference on Wed., April 6, 2011 at 9 a.m. at the National Mine Academy, room C-121. Two persons from each of your respective groups may attend if desired.

Your attention to the above is appreciated.

Sincerely,

Norman Page
Chief Investigator

cc: Max Kennedy (304-346-0353)
REFERENCES
REFERENCES


WE WILL NEVER FORGET OUR UBB BROTHERS

April 5, 2010