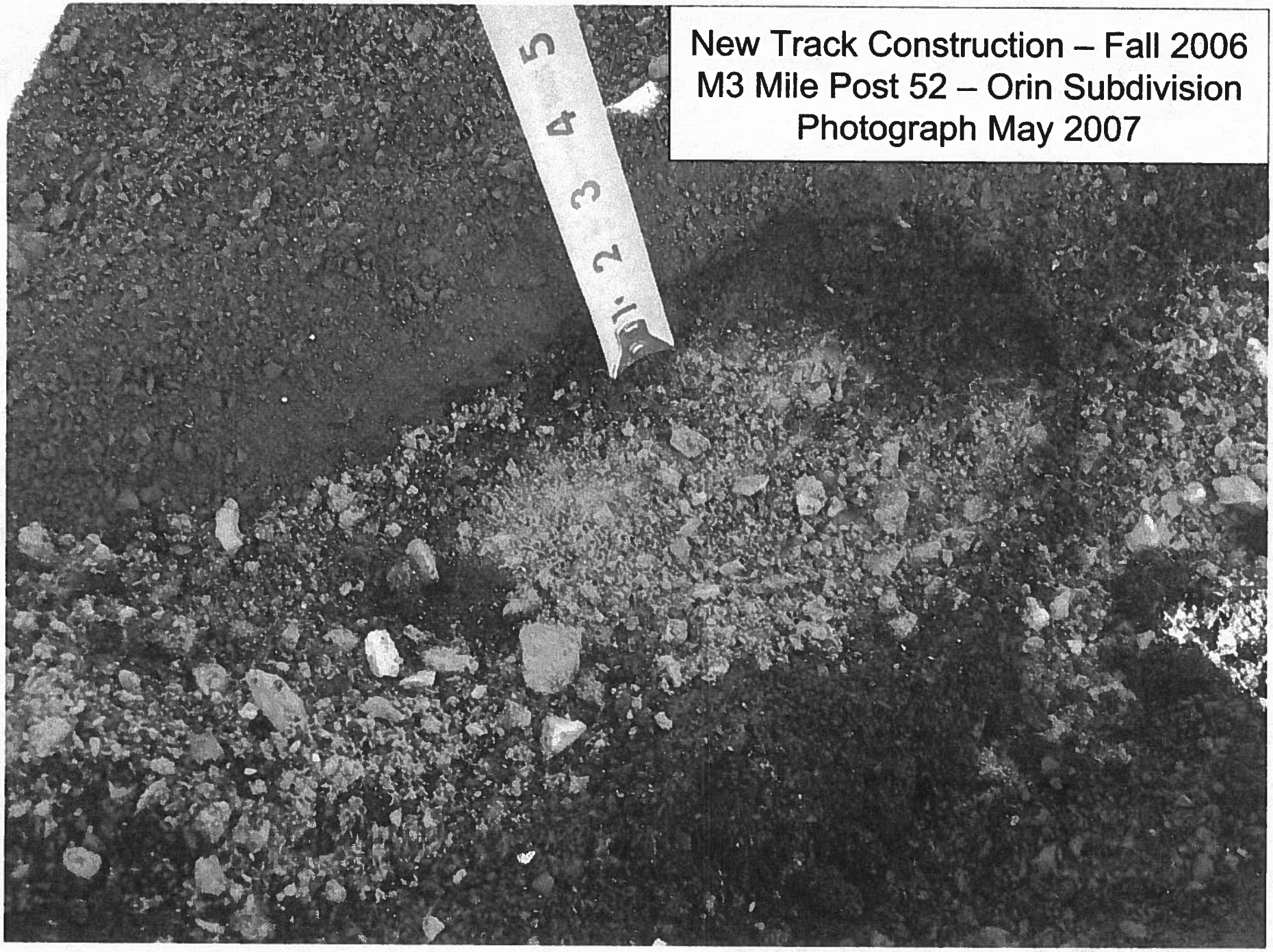
EXHIBIT 2

05/05/2008 14:10



New Track Construction – Fall 2006
M3 Mile Post 52 – Orin Subdivision
Photograph May 2007

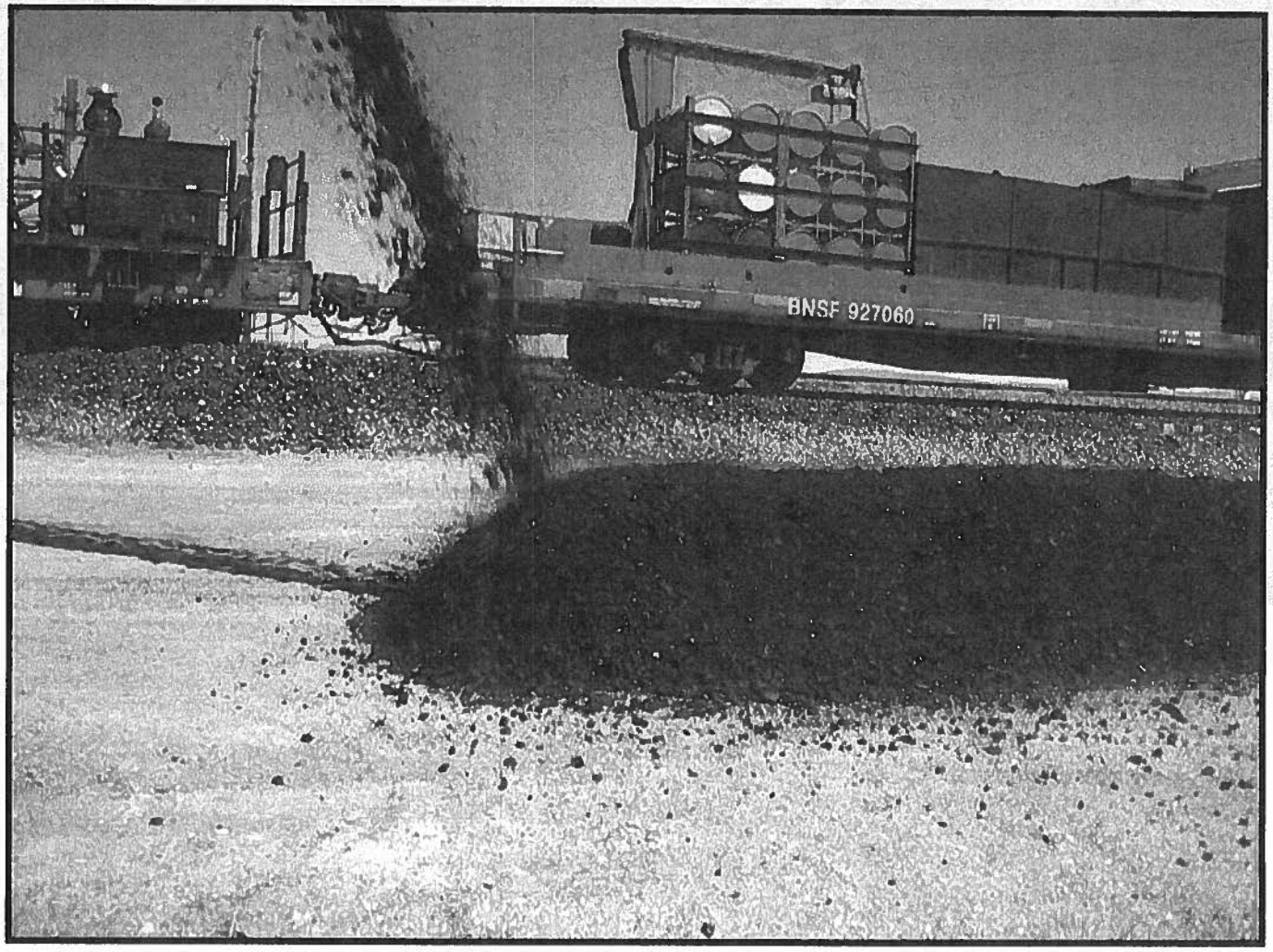
Nacco Bridge

EXHIBIT 3

09/11/2008 13:19

Reno Subdivision - UC01

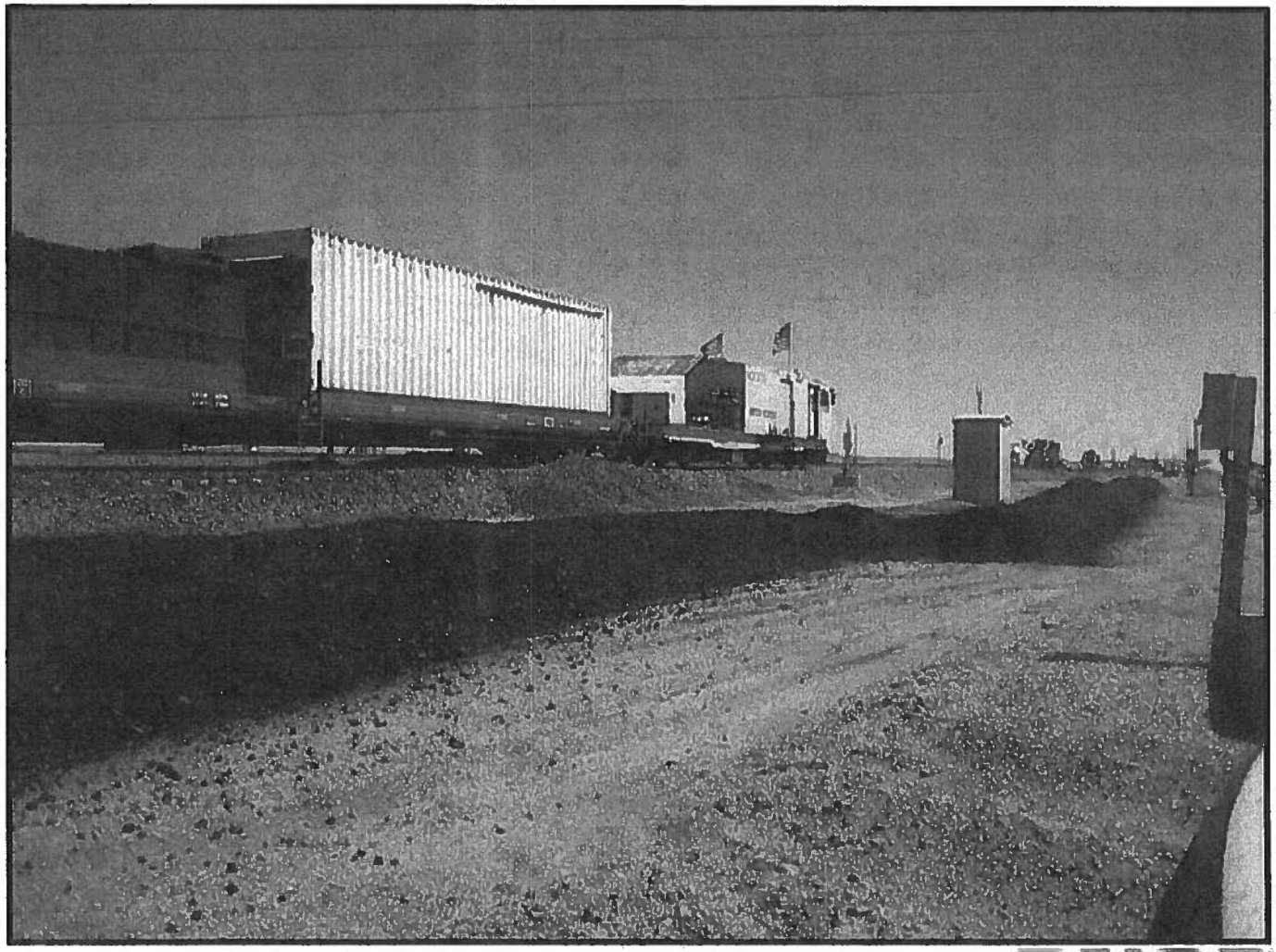
2009
Undercutter work
Note normal ballast
Is not "black".



BNSF

Reno Subdivision - UC01

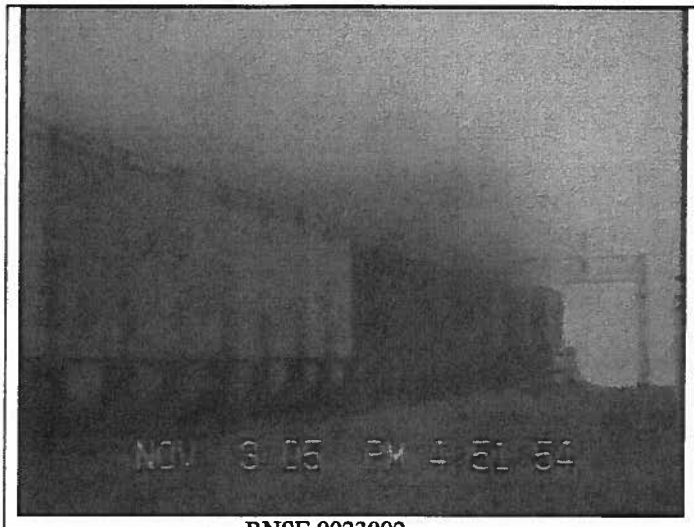
2009
Undercutter work



BNSF

EXHIBIT 4

Counsel's Exhibit #4 (On CD)



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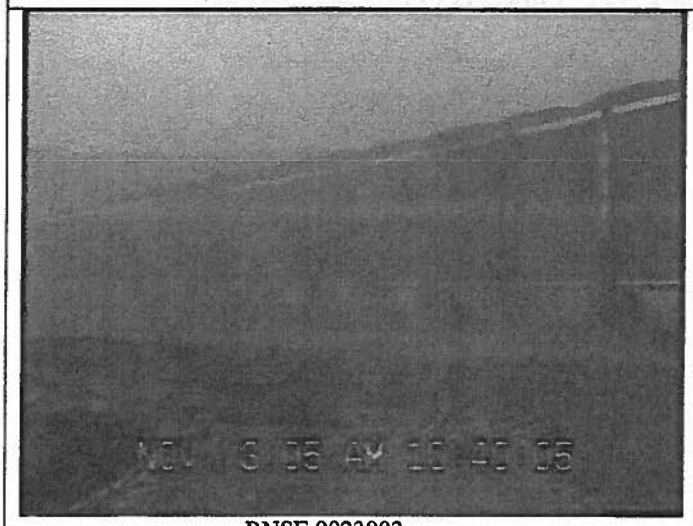

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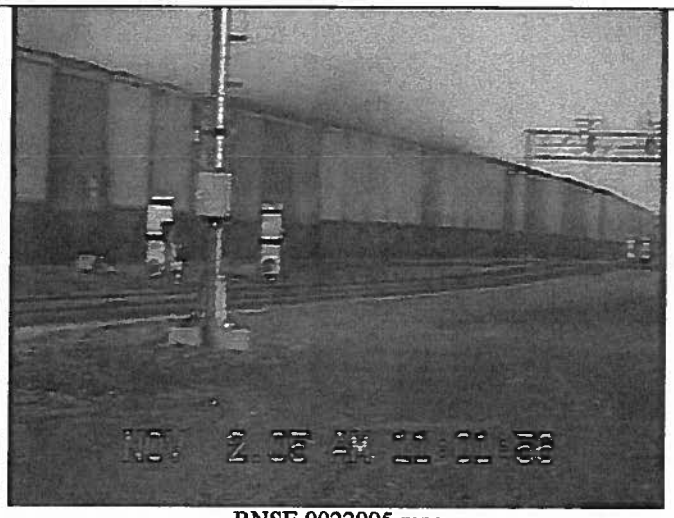

BNSF-0022995.mpg

VERIFIED STATEMENT OF GREGORY C. FOX

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35305

PETITION OF ARKANSAS ELECTRIC COOPERATIVE
FOR A DECLARATORY ORDER

VERIFIED STATEMENT OF GREGORY C. FOX IN SUPPORT OF
BNSF RAILWAY COMPANY'S OPENING EVIDENCE

My name is Gregory C. Fox. I am Vice President, Transportation of the BNSF Railway Company, a position I have held since May 2007. In this position, I have responsibility for leading BNSF's transportation team, which includes Field and Network Operations, Locomotive Distribution, and Crew Management. The team includes almost 20,000 employees and has an annual budget that exceeds $2.2 billion.

The purpose of my verified statement is to explain to the Board that coal dust emissions from rail cars must be substantially eliminated to ensure the safe, efficient, and reliable operation of rail lines in the Powder River Basin ("PRB"). Coal fired electric utilities throughout the United States rely upon an assured supply of Powder River Basin coal. BNSF is not willing to incur the risk of supply disruptions that could occur if coal dust accumulates in the roadbed, fouls the ballast that supports our track structure and thereby compromises the integrity of that track structure. BNSF must be able to limit coal dust emissions in the interest of providing reliable coal transportation service. I urge the Board to find that BNSF's coal dust emissions standards at issue in this proceeding are a reasonable means of addressing the coal dust problem that we have encountered on our railroad.

Work Experience and Education

I began my railroad career in 1984 as a corporate management trainee for the former Burlington Northern Railroad. During my early years I held operations positions such as trainmaster, terminal trainmaster, and terminal superintendent. In 1988, I became Manager, Finance and Strategic Planning, and I subsequently held a series of positions in Finance until 1992, when I was promoted to Director, Information Technology, Information Systems Services. Over the next ten years, I held a series of technology-related positions including Assistant Vice President, ISS; Vice President, eBusiness; Vice President, Technology Services; and Chief Information Officer.

In September 2002, I was named Vice President, Engineering, a position I held until I was named to my present position in May 2007. As Vice President, Engineering, I oversaw BNSF's efforts to provide safe, efficient, and reliable physical infrastructure, tracks, signal systems, bridges, tunnels, and buildings. From 2006 to 2007, I also served on the Board of Governors of the American Railway Engineering and Maintenance Association, which recommends standards for various engineering aspects of railroad infrastructure.

I have a B.S. in Finance and Transportation Management from the University of Colorado and a Masters of Business Administration in Corporate Finance from Avila College.

Concerns About the Impact of Coal Dust on PRB Lines Predated the 2005 Derailments.

Since the 1970s, BNSF and its predecessor Burlington Northern has had to deal with coal dust accumulations on the right of way. When I became Vice President, Engineering, in September 2002, BNSF understood that accumulated coal dust affected the reliability of rail switches and contaminated the ballast, but we did not fully appreciate the magnitude of the impact that coal dust could have on the integrity of the roadbed. We thought the problems

caused by coal dust were mainly limited to the reliability of switches, the risk of the coal dust catching fire, and the burdens of increased maintenance requirements. The increased maintenance included undercutting and switch undercutting, other surfacing requirements, and increased switch maintenance. This additional maintenance activity affected operations on the Joint Line since maintenance work reduces track capacity and causes slow orders as trains on adjacent track must travel below maximum speed to ensure the safety of the maintenance operations.

Although we were generally aware that coal dust caused problems, we had not intensively studied coal dust, we were not aware of the magnitude of the adverse impact to the track structure, nor had we adopted specialized programs to deal with the coal dust problem. However, by late 2002, coal dust became a source of heightened concern regarding the long term stability of the roadbed. With steadily increasing traffic volumes on the Joint Line, coal dust deposits on the right of way far surpassed BNSF's historical experience. As a result, in December 2003, BNSF undertook a study to quantify the magnitude of the problems associated with coal dust on the roadbed.

Throughout 2004, BNSF continued to monitor and study the rate of coal dust accumulation, the magnitude of the deposits, and the seasonal and locational impacts of coal dust accumulation on Joint Line operations and maintenance. This review was intended to form the basis of a long term plan that would address the increasing amounts and rate of coal dust deposits on the roadbed while ensuring that BNSF could accommodate the increasing volumes of coal traffic on the Joint Line.

In late 2004, preliminary findings from the coal dust study were reviewed internally within BNSF's engineering department. *See* Ex. 1. In the first quarter of 2005, a cross-

functional team within BNSF was formed to develop and coordinate a long term strategy for dealing with coal dust deposits along the Joint Line that would allow BNSF to meet the need for rising demand for coal shipments. By early May 2005, we believed that we had sufficiently quantified the coal dust problem to present our findings to BNSF's CEO. *See* Ex. 2.

While we were concerned about the increasing accumulations of coal dust, rail operations on our coal lines were satisfactory through the early spring of 2005. The Joint Line had accommodated record volumes in 2004 and the first four months of 2005. BNSF had increased its inspection and maintenance activities to deal with coal dust and we were confident that this expanded maintenance activity would be adequate to support Joint Line operations until long-term solutions could be implemented to address the problem of coal dust accumulations. However, subsequent events demonstrated that we had underestimated the risks posed by coal dust.

The May 2005 Derailments on the Joint Line Made it Clear that Coal Dust Presents a Serious and Unacceptable Risk to Reliable Service.

On May 14, 2005, a BNSF coal unit train derailed on the Joint Line. On May 15, 2005, less than eighteen hours later, a UP coal unit train derailed on the Joint Line a few miles away from the first derailment. These derailments and the work required to repair the affected lines severely disrupted coal operations in the PRB. BNSF, in consultation with our Joint Line co-owner Union Pacific, took immediate short-term measures to address the derailments and to rehabilitate track and roadbed conditions. As Vice President, Engineering, I led BNSF's efforts to restore operations on the Joint Line as quickly as possible. We immediately cleaned the site and rebuilt the track so that train operations could be resumed within a matter of days, although at a reduced level. Over the next few months, we undertook comprehensive rehabilitation

measures such as undercutting substantial portions of the Joint Line, putting in new ballast, and cleaning turnouts.

Although we tried to minimize the disruption to the around-the-clock service that Joint Line shippers rely upon, the remedial track maintenance unavoidably reduced available track capacity and required slow orders because of safety concerns. As a result, coal loadings at PRB mines served by the Joint Line were briefly halted after the derailments and were substantially reduced during the rest of 2005. Congestion and reduced loadings on the Joint Line depleted some utilities' coal stockpiles just as they were about to experience high demand for electricity during the hot summer months. It was widely reported that some coal shippers sought alternate supplies of power on the open market.

As in all cases of derailments, BNSF investigated the causes of the May 2005 derailments. We concluded that the derailments were attributable to a confluence of events. First, an extraordinary amount of rain and snow had fallen over a short time period in late April and early May. Drying cycles were not long enough to allow moisture to drain from the roadbed. Second, temperatures were warm enough by mid-May that the frozen ground was thawing and additional sub-surface moisture was rising up through the roadbed. Third, the coal dust accumulations in the rail ballast had exacerbated the drainage problems caused by the excessive moisture in the roadbed. The mixture of coal dust and water caused the ballast to weaken to the point that the roadbed no longer provided adequate support for the rails.

Some coal shippers have claimed that the 2005 derailments on the Joint Line were the result of inadequate maintenance. In fact, we had been maintaining the Joint Line and our other coal lines to a high standard. Our ability to accommodate record volumes of coal up to the point of the derailments confirmed our belief that the coal lines were well maintained. In retrospect, if

we had understood the full impact coal dust has on the track structure or if we had been able to anticipate the extraordinary weather events of late April/early May, we would have undertaken additional, extraordinary maintenance measures that might have prevented the derailments. But viewing our maintenance of the coal lines based on how we were performing and what we knew up to the time of the derailments, I do not believe our maintenance practices can be faulted. And it certainly makes no sense to say that inadequate maintenance caused the derailments because our pre-derailment maintenance was not in any way sub-standard.

BNSF Must Be Able to Establish Operating Rules to Ensure Efficient and Reliable Service.

The May 2005 derailments caused BNSF to focus on the problem of coal dust with a heightened sense of urgency. While we have never claimed that coal dust was the sole cause of the derailments, it was absolutely clear that the presence of coal dust in the ballast had contributed to the derailments and that coal dust was a ballast fouling agent that could be expected to weaken the track structure. While BNSF expanded its inspection and maintenance activities to prevent the recurrence of another derailment, the risk of serious operating problems would remain as long as substantial quantities of coal dust were being emitted from loaded cars and being deposited on the right of way. Therefore, immediately following the May 2005 derailments, BNSF initiated a high priority study to understand the full extent of the coal dust problem and to identify ways of eliminating or substantially reducing coal dust emissions from loaded coal cars. I put William VanHook, Assistant Vice President of Engineering in charge of the coal dust project. I asked him to keep our coal shippers and the coal mines informed of our progress in the study and, in particular, to work with the National Coal Transportation Association ("NCTA"), as NCTA had acknowledged the importance of addressing the problem of coal dust. *See* Ex. 3.

Under Mr. VanHook's supervision, BNSF and its consultants collected a large amount of data on the sources of coal dust in the PRB and the alternatives for curtailing coal dust emissions. As described in other witness statements, BNSF collected a large amount of data on coal dust emissions over a period of two years. We determined that the best way to deal with the coal dust problem would be to adopt a performance standard that would require coal shippers to limit emissions of coal dust from loaded cars. Using the data we had collected, BNSF established a limit on coal dust emissions which, if met by all coal trains moving on the Joint Line and on BNSF's Black Hills Subdivision, would substantially eliminate coal dust from the railroad right of way. The development of those emissions standards is addressed by other witnesses in this proceeding. BNSF adopted its Joint Line coal dust emissions standards first as an operating rule that applies to coal trains moving on the Joint Line, including Union Pacific trains. The Joint Line emissions standard, as well as the Black Hills Subdivision standard, was subsequently made applicable to BNSF common carrier shippers through BNSF's rules publication. As described by other BNSF witnesses, the standards are readily achievable by shippers that make a good faith effort to meet them.

It is standard practice in the rail industry for rail carriers to adopt operating rules designed to ensure safe, efficient, and reliable rail operations. Numerous operating rules govern the way freight is loaded and secured in railcars to ensure safe operations and avoid operating disruptions. Under BNSF's general loading rule, shippers are responsible for securely loading their freight so that the freight stays in rail cars. *See* Ex. 4 at BNSF_COAL_DUST_0082736. Other rules apply this general rule in particular contexts. For example, operating rules govern the manner in which heavy equipment and scrap metal are loaded and secured in railcars to ensure safe operations and avoid service disruptions. *See* Exs. 5-6. Additionally, there are

operating rules that govern leakage of freight in transit. *See* Ex. 7. Other rules set specific standards for railcars so that the cars do not damage BNSF's property beyond normal wear and tear. *See* Ex. 8.

BNSF's coal dust emissions standards are like numerous other operating rules that require rail shippers to take actions with respect to the freight they load into railcars to ensure the safe and efficient movement of trains. Some coal shippers contend that BNSF should not be permitted to address coal dust through an operating rule designed to limit coal dust emissions. These shippers claim that BNSF should be required to deal with coal dust after it has fallen onto the right of way through expanded maintenance. But shippers of other commodities are not allowed to contaminate BNSF's right of way and compromise the integrity of our track structure simply because BNSF can fix the damage after the fact. The coal that falls onto the railroad right of way belongs to the shippers and it is their responsibility to keep it in the cars.

From a maintenance of way perspective, it is better to keep coal dust out of the ballast in the first place, rather than to undertake extraordinary measures to maintain a railroad that is compromised by coal dust. The challenges of detecting coal dust deposits that are not readily apparent on the surface but have worked their way into the ballast means that we cannot be certain that enhanced maintenance will always address the problem before it manifests itself. Moreover, maintenance of way activities are intrusive and disrupt train operations. Tracks must be taken out of service and slow orders issued to allow maintenance work to proceed. Maintenance effectively consumes capacity on the railroad, and on a very heavily traveled line like the Joint Line, the capacity available for maintenance activities is limited. Therefore, it is not a question of simply expanding maintenance to deal with coal dust. Eventually, new track would need to be added just to be able to maintain the existing rail infrastructure.

Finally, addressing the problem of coal dust through expanded maintenance is not a responsible way to deal with a problem that has the potential for disrupting the supply of PRB coal. The risk of service interruptions on PRB coal lines, including the Joint Line, requires that coal dust be kept from falling out of the loaded cars onto the right of way. Balancing the burdens of coal dust emissions restrictions against the risk of service disruption resulting from compromised track structure, leads to a very clear answer – we must take the steps necessary to avoid the risk of service disruption. There is no reason for the Board to second guess this conclusion.

The solution to the coal dust problem is to require that shippers take measures necessary to keep their coal in the coal cars. BNSF's coal dust emissions standards represent a reasonable limit on coal dust that shippers should be required to meet.

I declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

Executed on March 15, 2010

Gregory C. Fox

Gregory C. Fox

VERIFIED STATEMENT OF STEVAN B. BOBB

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35305

PETITION OF ARKANSAS ELECTRIC COOPERATIVE CORPORATION FOR A DECLARATORY ORDER

VERIFIED STATEMENT OF STEVAN B. BOBB IN SUPPORT OF BNSF RAILWAY COMPANY'S OPENING EVIDENCE

My name is Stevan B. Bobb. I am Group Vice President, Coal Marketing for BNSF Railway Company ("BNSF"), a position I have held since the spring of 2006. In this position I have responsibility for the sales and marketing of BNSF's coal transportation services. Coal transportation is one of BNSF's four principal lines of business. In 2009, we transported 283 million tons of coal. The vast majority of this coal originates at mines located in the Powder River Basin ("PRB") of Wyoming. Coal originated in the PRB moves primarily to electrical utilities located throughout the western United States and is interchanged with eastern railroads for delivery to utilities located in the East as well. Coal transportation is a critical component of the domestic U.S. energy supply chain, and BNSF transports the largest volume of coal to domestic receivers of any U.S. railroad.

The purpose of my verified statement is to address from the marketing perspective both the problems created by coal dust emissions and potential ways to prevent those problems. As past events demonstrate, the accumulation of coal dust on densely traveled coal lines creates the risk of significant disruption to our rail operations, and also to the operations of our competitor the Union Pacific Railroad Company ("UP") who is a joint owner of the PRB Joint Line with us. Disruption of rail operations threatens the coal supply chain and creates serious risks of curtailed

energy generation. BNSF has concluded that those risks can best be controlled by limiting coal dust emissions from rail cars while in transit. We believe that effective measures exist to control coal dust emissions and that the shippers who own the coal that falls onto our railroad line have the ability and responsibility to adopt such measures. BNSF has established coal dust emissions standards in the interest of maintaining the integrity of the coal supply chain, and we are optimistic that coal shippers will recognize that it is in their own larger interest to take voluntary measures to limit coal dust emissions.

Education and Work Experience

I have a B.S. in Agriculture from North Dakota State University. I joined BNSF's predecessor, the Burlington Northern Railroad, in 1987 and have been employed continuously by the railroad since that date. Following some early work in information systems and marketing support, my career has been spent primarily in line marketing positions. This has included extensive work in Minerals and Chemicals Marketing, where I eventually rose to the level of Vice President Minerals Marketing in June 1996. I subsequently became Vice President Chemicals Marketing in October 1996, Vice President of Agricultural Commodities Marketing and then Group Vice President, Agricultural Products Marketing. I became Group Vice President, Coal Marketing, which is my current position, in the spring of 2006. In addition to these marketing positions, I spent one year in an operations job as General Manager of BNSF's Texas Division in 2005 and a year as Vice President Business Unit Operations in 2004.

Operation of and Volume Growth over the PRB Joint Line

The Powder River Basin in northeastern Wyoming produces the largest volume of coal of any producing region in the United States and provides approximately 40 percent of the coal consumed in the country. Both BNSF and UP have access to the PRB. A critical artery for

accessing the PRB mines that produce the majority of PRB coal is the 103 mile segment of railroad owned jointly by BNSF and UP that extends from Coal Creek Junction, WY in the North to Shawnee Junction, WY in the South.

A 1983 Joint Line Agreement between BNSF and UP predecessors governs rail operations over the Joint Line. This Agreement, which was approved by the Interstate Commerce Commission, establishes BNSF as the operator of the Joint Line, makes BNSF responsible for the maintenance of the Joint Line, and gives BNSF the right to establish rules for Joint Line operations without discrimination in favor of either party. The Joint Line Agreement is attached to this statement as Exhibit 1.

The Joint Line began operating as a joint facility in 1984. Traffic levels and Joint Line capacity have both increased tremendously over the intervening period. Combined BNSF/UP coal tonnage originated on the Joint Line increased from approximately 76 million tons in 1984 to 212 million tons in 1997. Over the eight year period from 1997 to 2005, Joint Line coal tonnage originations increased another 113 million tons (or 53 percent) to 325 million tons. Joint Line coal tonnage reached a high of 375 million tons in 2008, but has dropped off somewhat from that level due to the recession.

The capacity of the Joint Line has steadily increased over the 26-year period of Joint Line operations. What began as a single track railroad with limited passing sidings has grown to a triple track railroad, with sections that are quadruple tracked. The Joint Line has sufficient capacity to accommodate over 60 loaded coal trains per day, and an equal number of empties. The maximum capacity of the existing Joint Line plant is estimated to be over 400 million tons.

The growth in Joint Line coal traffic and capacity is significant for two related reasons. First, this growth underscores the increasingly critical role that the Joint Line plays in the energy

supply chain. Second, this growth in coal volumes originating on the Joint Line is a primary reason why coal dust has emerged as a major problem on our railroad. Greater volumes transported over the rails means more coal dust emissions and the faster build-up of coal dust along the right of way.

Awareness of the Coal Dust Problem

In May 2005 while I was working as General Manager of BNSF's Texas Division, I became aware that two derailments had occurred on the PRB Joint Line and that those derailments, coupled with the need to repair the affected lines, caused serious disruption to coal operations in the PRB. I also learned indirectly that while heavy precipitation coupled with spring thaws was a triggering cause of the derailments, the accumulation of coal dust in the ballast underlying the track structure had been a significant contributing cause of the derailments. While anyone who was employed with the company at the time would have been aware of the derailments and the challenges to our operations and our shippers' operations, I did not have any personal involvement with the derailments or issues associated with coal dust in 2005.

I began to learn in detail about the coal dust problem in the spring of 2006 when I took over the job of Group Vice President, Coal Marketing. I learned about coal dust from my predecessor, Tom Kraemer, and I learned about it in greater detail from Bill VanHook, a BNSF Assistant Vice President & Chief Engineer Systems Maintenance and Planning, who had been tasked by our senior management with the job of understanding and addressing the coal dust problem. Over time, as I had occasion to travel to the PRB, I also learned about the coal dust problem from my own first hand observations, as the presence of dusting was and continues to be readily apparent from the observation of coal dust blowing out of loaded coal cars and visibly accumulating along the right of way.

In my transition to coal marketing, I learned that BNSF engineering personnel, including Mr. VanHook, had engaged in considerable study and concluded that unacceptable quantities of coal dust were accumulating along the right of way of portions of BNSF's coal network, including the Joint Line and other lines in and adjacent to the PRB, and that these accumulations posed risks to the integrity of the track structure, which in turn posed risks to the coal supply chain. I learned that Mr. VanHook and others at BNSF were in the process of trying to understand the science of coal dust in various different dimensions, including (1) the monitoring and measurement of coal dust levels; (2) the effect of coal dust on ballast and track structure; and (3) the identification of effective measures for limiting coal dust emissions. Work in each of these areas was already underway when I joined the Coal Marketing Department in the spring of 2006, a year after the PRB derailments. This work has continued without interruption over the last four years and progressed to the point that BNSF believes that we will be able to solve the coal dust problem. Doing so will require a collective, affirmative effort on the part of the shippers that own the coal and the coal mines that sell it to them, as well as the railroads that haul PRB coal.

Continuing Outreach to Coal Mines and BNSF Coal Shippers

BNSF's approach to the coal dust problem has involved continuing outreach to PRB coal mines and to the electrical utilities that are the principal shippers of PRB coal. The mines must be part of the solution to the coal dust problem because they are the shippers' agents and they are the entities that load the coal dust into coal cars. The nature of the loading affects the level of the dusting. The shippers must participate in the solution to the coal dust problem because the shippers own the coal and they bear responsibility for the commodities that they ask us to transport. The concept of shipper responsibility for controlling spillage of commodities shipped

over the railroad is an established one in our industry. Just as the railroad cannot accept leakage of toxic chemicals from defective valves on tank cars, it should not be expected to accept emissions of coal from coal cars that foul the ballast and compromise the integrity of the track structure. It is particularly appropriate that coal shippers participate in the solution to the coal dust problem because a principal objective of that solution is to avoid disruptions to the coal supply chain that could result from compromised track structure.

When I first took over as head of Coal Marketing, BNSF outreach on coal dust was focused on a coal shipper and producer trade association, the National Coal Transportation Association. That is, we were performing a joint coal dust study with various sub-committees working on different facets of the issue. At this time our communications and position explanations regarding coal dust issues were primarily with the NCTA coal dust working group. We understood that NCTA was communicating directly with its broader membership. Eventually our focus shifted from interactions primarily with NCTA to direct interactions with BNSF coal shippers, individually and through a variety of public forums.

We have not interacted with UP shippers unless they happen also to be BNSF shippers, in which case we deal with them on coal dust, as on other matters, solely in their role as BNSF shippers. However, because UP operates over the Joint Line and because coal dust emitted from trains operated by UP to transport its customers' coal is a source of the coal dust problem, we have issued a Joint Line operating rule, applicable both to BNSF and UP, that incorporates the coal dust emissions standard set forth in BNSF's rules publication. That rule was communicated to UP's Executive Vice President – Operations from BNSF's Chief Operating Officer on November 7, 2008, and is attached hereto as Exhibit 2.

A significant amount of my personal attention over the past four years has been devoted to meeting with coal mines and BNSF shippers on issues related to coal dust. We have found the attitude of the mines to be generally constructive and have made tangible progress towards reducing coal dust emissions through efforts focused on the loading of coal trains. Specifically, our consultants from Simpson Weather Associates performed studies indicating that coal dust emissions could be reduced by shaping the profile of the coal loaded into coal cars. The proper profile of the loaded coal can be achieved by using a modified coal loading chute and by careful attention to the loading process by the individuals overseeing that process. This portion of our mitigation program has been a success, as all coal mines have installed the modified loading chutes that allow the proper profile to be achieved. They have also been generally receptive to our proposals to provide real-time feedback on the loading of coal cars through the use of laser monitoring devices so that their loading operators are able to achieve optimal loading profiles. This implementation of improved loading techniques has been a positive, although somewhat modest, step in reducing coal dust emissions.

I personally have attended dozens of meetings with individual coal shippers on coal dust issues over the past several years, as well as numerous meetings and conferences attended by multiple shippers at which the topic of coal dust was addressed. Throughout these discussions, whether in private or otherwise, my efforts have focused on promoting a consensual solution to the coal dust problem whereby shippers will voluntarily accept responsibility for curtailing emissions of coal dust. We have sought to do this through an approach designed to be deliberate, fact-based and transparent. We have shared the coal dust science with our shippers. We have shared our test results. We are now involved in an extensive trial of measures that can be used by shippers to limit coal dust emissions. We undertook the facilitation of this trial at the request

of several customers. To date, we have been encouraged by the level of mine and shipper participation in the trial. Our hope and expectation is that when shippers have seen first-hand that there are effective methods available to limit coal dust emissions to acceptable levels, they will voluntarily adopt those methods.

Adoption of a Performance Based Standard

Mr. VanHook describes in his Verified Statement the process that BNSF went through to develop the coal dust emissions standards at issue in this proceeding. After consultation with senior BNSF management, those standards were first placed in BNSF's rules publication on April 30, 2009 for the Joint Line and May 27, 2009 for the Black Hills Subdivision. BNSF established the emissions standards only once we believed that we had done enough testing and analysis to justify imposing the standards. As explained by others, we believe that the standards we have adopted are conservative in the sense that any shipper that makes a good faith effort to comply with the standard will be able to achieve compliance. And we believe that widespread acceptance of the standard will solve the coal dust problem.

The IDV.2 standards set out in our rules publication are performance based in that they establish a level of dusting that should not be exceeded. The standards do not specify behavior that must be pursued to comply with the standards. By adopting a performance based standard rather than prescribing a particular method of controlling coal dust emissions, BNSF sought to allow individual industry members to determine the most efficient and cost effective method of coal dust containment. As shippers will have the incentive to select cost effective suppression methods, vendors of various coal dust emission suppression methods and products will have the incentive to continue to innovate to come up with less costly and more effective suppression

measures. We are already seeing this process unfold, as multiple vendors of dust suppression products have sought to participate in the ongoing trial.

We believe that the adoption of our emissions standards will have benefits for the mines and shippers beyond maintaining the integrity of the coal route that they rely on. Coal dust suppression at the mine origin and the utility destination is one set of additional benefits that we anticipate. We also understand that other beneficial treatments are now available (such as suppressing spontaneous combustion) that utilize some of the same application infrastructure used to curtail dust emissions. Another useful byproduct of the coal dust standard is the dissemination of testing information from our monitoring devices that will allow shippers to observe the level of dust reduction being achieved. By providing individual train performance data of the shippers' trains as they pass the TSM sites, they will be able to see over time the effectiveness of their efforts in mitigating the loss of coal off of the rail cars using whichever method they desire to use.

We are hopeful that voluntary compliance with our standard by the shipping community will eliminate any need to adopt enforcement measures. However, if it should be necessary to adopt enforcement measures at some time in the future, we will provide sufficient advance notice to give interested parties an opportunity to raise any issues related to those measures before they are implemented.

I declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

Executed on March 15, 2010

Stevan B. Bobb

VERIFIED STATEMENT OF WILLIAM VANHOOK

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35305

PETITION OF ARKANSAS ELECTRIC COOPERATIVE CORPORATION FOR A DECLARATORY ORDER

VERIFIED STATEMENT OF WILLIAM VANHOOK IN SUPPORT OF BNSF RAILWAY COMPANY'S OPENING EVIDENCE

My name is William VanHook. I am Assistant Vice-President and Chief Engineer-Systems Maintenance and Planning for BNSF Railway. Since 2005, I have been responsible for coordinating and overseeing BNSF's efforts to study the scope of the coal dust problem in the Powder River Basin ("PRB") and to investigate measures to curtail coal dust emissions. The purpose of my Verified Statement is to describe for the Board the extensive measures that BNSF has taken since 2005 to address the problem of coal dust in the PRB. As I explain below, the emission of coal dust from loaded coal cars presents a serious challenge in maintaining the structural integrity of one of the most important portions of the rail network in the United States. I urge the Board to affirm BNSF's authority to address this problem and to affirm the reasonableness of BNSF's requirement that there be limits on the emission of coal dust from coal cars in transit.

As AVP Engineering at BNSF, I have responsibility for ensuring that the BNSF rail network is built and maintained to a level that permits efficient and reliable transportation for BNSF's shippers. Among other things, I oversee the development and implementation of a $1.5 billion annual capital maintenance budget and a $900m operating budget for the engineering department. I support BNSF's engineering field personnel and make sure they have the

information and resources necessary to maintain BNSF's physical plant. I oversee the Engineering Information Technology Group, which is responsible for the collection of a vast amount of engineering information and for making that information available in a usable and accessible form to BNSF's field personnel. I facilitate BNSF's inspection of tracks and track structure through end user programs and interfaces. I am responsible for BNSF's large fleet of test and rail maintenance cars, including its track geometry cars, rail detection cars, and rail and switch grinders. I interact with the Federal Railroad Administration and other government regulatory agencies on matters relating to track conditions and formulation of new regulations through various Railroad Safety Advisory Committee meetings.

I have been employed by BNSF for 16 years. Since 1995, I have been responsible for the construction of new track, signal, bridge and facilities initially for one region of BNSF, then subsequently for the entire BNSF system, as director construction, AVP Construction Santa Fe Lines and AVP Engineering Services. In 2001, I was appointed to my current position with system maintenance responsibilities. I have over 30 years of railroad experience. Prior to joining BNSF, I was employed by the Norfolk & Western Railway, the Southern Pacific Railroad, the Atchison, Topeka & Santa Fe Railroad, the Chicago, Missouri & Western Railroad and the Norfolk Southern Corporation. At each of these railroads, I was in the engineering department and my responsibilities were varied, including track maintenance, building maintenance, expansion of the physical plant, establishment of and maintaining track standards, oversight of signal and bridge maintenance, and planning and scheduling of overall company capital maintenance programs and operating budgets. I have a bachelors and masters degree from the State University of New York, Buffalo, in civil engineering.

The 2005 Joint Line Derailments Led to a Concerted and High Priority Effort to Understand and Address the Problem of Coal Dust.

In 2004, I became aware of the persistent and difficult problems that were caused by coal dust that was being blown out of loaded coal cars in transit from PRB coal mines. Spontaneous fires were occurring along the right of way on the PRB lines from the large volumes of accumulated coal dust. Rail switches were being fouled by the coal dust. Coal dust was piling up along bridge abutments and creek beds. Slow orders on the heavily traveled PRB lines were increasing as BNSF carried out increased maintenance activity to deal with the coal accumulations. I also became aware of complaints from local ranchers in Wyoming about coal dust deposits on their property.

I did not have primary responsibility for dealing with coal dust issues in 2004 but I participated in several presentations and discussions of the issue. Indeed, just a few days before the derailments occurred in 2005, I participated in a high level internal meeting that addressed BNSF's on-going study of the coal dust problem. *See* Exhibit 1. At the meeting, we were informed about the efforts of BNSF's division managers to understand the sources and amount of coal dust accumulating on the right of way and BNSF's preliminary views regarding alternatives to deal with the problem. BNSF had already conducted field measurements of coal dust and analyses of ballast contaminated by coal dust.

On May 14 and 15, 2005, two derailments occurred on the Joint Line within a few miles of one another. Gregory Fox, who was BNSF's Vice President, Engineering at the time, took the lead in dealing with the immediate consequences of the derailments. The sites were cleaned and the track was put back into service. Over the next several months, BNSF undertook a comprehensive rehabilitation of the Joint Line which reduced track availability and coal shipments. BNSF studied the causes of the derailments and concluded that the derailments had

resulted from a combination of unusual weather conditions – an extraordinary amount of rain and snow had fallen during the spring thaw – and high levels of coal dust in the ballast which had weakened the track structure due to the lack of proper ballast support.

While Greg Fox focused on the short-term engineering and maintenance responses to the derailments, he asked me to take the lead on dealing proactively with the coal dust problem from a long-term standpoint. It was clear that BNSF had to take measures to prevent a recurrence of the derailments and the severe adverse service impact to our customers caused by these outages. The widespread presence of such large quantities of coal dust along the right of way and in our track structure was not acceptable on high volume rail lines like those in the PRB that were of such critical importance to the rail network and to the nation's economy. BNSF decided to expand substantially its prior efforts to understand the scope and causes of the coal dust problem in the PRB and to investigate possible ways to curtail coal dust emissions. I took the lead on this new project.

BNSF has given the highest priority to these efforts. Throughout my work on this project I have consulted with senior management at BNSF, informed them of my progress and obtained approval for the actions we have taken. It was widely agreed among senior BNSF management that the presence of large quantities of coal dust on the right of way presented unacceptable risks to the reliability of coal transportation in the PRB. We also believe that over time coal dust deposits on BNSF's track and right of way will grow outside of the PRB. Unless measures are taken to curtail coal dust emissions, service to other shippers could be adversely affected.

BNSF Immediately Set Up an Expanded Data Collection Network so that the Coal Dust Problem Could Be Addressed on a Scientific Basis.

The fact that large quantities of coal dust escape from loaded coal cars in transit is undeniable. Accumulations of coal dust are obvious in many areas along the right of way in the

PRB. *See* Exhibit 2. Plumes of coal dust can often be seen from passing coal trains. *See* Exhibit 3. When standing near the rail lines, I have often had to avert my face when a loaded coal train passes to avoid being pelted with coal particles. I have even heard the impact from coal on my hard hat after turning my face away from the coal pieces coming off the top of the rail cars. As we expanded our investigation, we have also observed coal deposits on our track structure outside of the PRB, although to a lesser degree than is seen on the PRB trackage. This is particularly evident on certain subdivisions where our coal traffic was and is a fairly significant part of our overall traffic.

While the problem of coal dust is obvious, BNSF wanted to make sure that any efforts it took to deal with the problem were based on a solid factual and scientific basis. So BNSF undertook to develop facts and data that would support any actions it took to address the problem. To help BNSF collect the necessary data, BNSF retained Simpson Weather Associates ("SWA"), an environmental firm that had substantial experience in addressing the problem of coal dust emitted from moving coal trains. SWA had worked extensively with the Norfolk Southern in the late 1970s and 1980s to address the problem of coal dust emissions from loaded rail cars of export coal moving from West Virginia to Norfolk and I believed that SWA could help BNSF expand and improve its data collection efforts. Before the derailments, BNSF had been working with an environmental engineering firm, Conestoga-Rovers and Associates ("CRA"), to conduct preliminary studies of coal dust accumulations. I concluded that it would help to bring SWA into this effort to work with CRA and take advantage of SWA's particular expertise in the area of coal dust. SWA began working extensively with BNSF in the summer of 2005 and has worked with BNSF since then. The President of SWA, G. David Emmitt, is

submitting a Verified Statement in this proceeding that describes the data collection efforts and protocols initiated by SWA from 2005 until the present.

To summarize briefly those efforts, SWA first set up an expanded network of dustfall collectors. Prior to the derailments, CRA had set up dust traps that collected dust accumulating on the ground next to the tracks. BNSF estimated that an average of about 80 pounds of coal dust accumulated each year in the coal traps. *See* Exhibit 1 at BNSF_COALDUST_0035071. SWA recommended that BNSF use a somewhat more sophisticated dustfall collector that was mounted slightly above the ground to estimate dust fall rates. SWA also recommended that several dustfall collectors be set up perpendicular to the tracks to measure the rate at which dust falls onto the right of way at different distances from the track and that the network of dustfall collectors be expanded along the Joint Line. *See* Exhibit 4. BNSF implemented these recommendations.

SWA also provided us with information on the use of surfactants and grooming of the coal loads in rail cars as was being done for Norfolk Southern export coal at the mines in West Virginia. Surfactants are chemicals sprayed onto the loaded coal to form a protective crust or an adhesive layer that holds the coal inside the car. I discuss in more detail below the use of surfactants on loaded railcars and the benefits that can be obtained by grooming loaded cars or by changing the load profile of the coal loaded into coal cars.

SWA also recommended that BNSF establish a Track Side Monitor ("TSM") station that would gather data on coal dust emissions from individual coal trains and collect additional information to help put the dust emission data in context. A TSM consists of a weather station and an electronic dust monitoring device mounted on a tower. *See* Exhibit 5 at BNSF_COALDUST_0079694. Based on designs SWA had used with NS, SWA provided

BNSF with a TSM that we set up at Milepost 90.7 on the Joint Line. We looked at several different sites for the TSM and chose Milepost 90.7 because that was a location where significant dust had accumulated in the past and because power was available nearby to support the TSM instruments. A tower was set up initially on one side of the track and later expanded to both sides of the track so that the dust monitor on the eastside tower could measure coal dust emissions from passing trains when the wind was blowing from the west and the westside monitor could measure coal dust when the wind was blowing from the east. The TSMs collect data on the ambient conditions and dust readings for each train passing the TSM and transmit the data directly to SWA. BNSF began collecting data on all passing trains in September 2005.

An important part of the TSM is the dust monitor, referred to as an e-sampler. The e-sampler measures the amount of dust emitted by individual trains passing the location of the TSM tower on which the e-sampler is mounted. *See* Exhibit 6. The e-samplers used in our TSMs are the best equipment available for measuring dust emissions in the field in part because they take measurements often enough to determine accurately the coal dust levels during the entire period that a train is passing by the TSM. I insisted that BNSF use state of the art equipment and I am confident from the research performed by SWA that no other equipment available today would provide the same level of detail and reliability as the instruments used in the TSMs. Of course, the environmental monitoring technology is evolving and it is possible that new or more sophisticated generations of dust monitoring devices will become available in the future. BNSF will remain open to using superior dust monitoring equipment as it becomes available. But the problem of coal dust must be addressed now, and BNSF is therefore relying on the best dust monitoring equipment that is available today.

The third data gathering approach recommended by SWA was also based on work that SWA had done for NS. SWA developed a set of instruments that could be mounted on individual coal trains and used to collect data along the entire route of movement of the train. The instruments consist of (1) a Rail Transport Emission Profiling System ("RTEPS") device, which is essentially a combination of a mobile weather station and an airborne dust monitor similar to the e-samplers used at the TSMs, and (2) Passive Collectors ("PCs"), which are metal boxes attached to the sill of coal cars that collect coal dust particles that are blown off of the loaded cars. *See* Exhibit 7. These instrumented trains are the best and quickest way of determining whether a particular coal dust containment technique is effective. For example, as discussed further below, it was possible to use the RTEPS/PCs to determine the relative effectiveness of different chemical surfactants without testing a large number of trains, which would have been necessary if we relied only on data gathered by the TSMs. With the permission of individual shippers, BNSF, CRA and SWA were able to set up RTEPS/PCs on trains where some cars were treated with a surfactant and other cars were left untreated. The relative effectiveness of a particular surfactant could be determined by comparing the amount of dust collected in the PCs attached to treated and untreated cars. I discuss in more detail below the tests that BNSF, CRA and SWA conducted on surfactants and the conclusions that we reached based on these tests.

BNSF Kept Its Coal Shippers Closely Informed of These Efforts and Responded to Numerous Questions and Data Requests from the Shippers.

From 2005, shortly after the derailments, and continuing through most of 2007, BNSF worked intensively with the National Coal Transportation Association ("NCTA") to provide results of tests and data analyses on coal dust issues and to respond to questions from NCTA members. NCTA is an association of coal producers, rail car owners and coal consumers that

deals with issues relating to coal transportation. We participated in quarterly meetings of NCTA and worked with a number of NCTA committees to collect, analyze, and distribute data and other information that BNSF was developing as it studied the problem of coal dust. We provided NCTA with regular updates on the studies that were being carried out. To give the Board an understanding of the high level of interaction with NCTA and the detailed presentations that BNSF was making to coal shippers during this time period, I attach to this statement some representative presentations that BNSF made to NCTA from November 2005 through August 2007. *See* Exhibit 6; *see also* Exhibit 8. BNSF employees and consultants attended the NCTA meetings and engaged in extensive dialog with NCTA members regarding coal dust issues. Employees of Union Pacific Railroad Company ("UP") also participated extensively in the NCTA presentations.

BNSF did far more than just keep NCTA members informed of the results of its data collection and analysis. From 2005 through 2007, BNSF also performed numerous studies at the request of NCTA members. During this time period, BNSF spent nearly $2 million on efforts to respond to NCTA members' questions. As we continued our studies in 2008 and 2009, we spent an additional $2.2 million. These expenses do not include the costs incurred by UP for its portion of the coal dust study efforts under the Joint Line Agreement. I describe below some of the studies we performed.

One of the mines suggested that the size of coal loaded into coal cars might affect the amount of dust that is emitted from the loaded cars in transit. Specifically, the mine was interested in knowing whether coal dust emissions could be substantially reduced by crushing coal to 3 inch pieces instead of 2 inch pieces. BNSF used several trains equipped with RTEPS/PCs over 5 days to test the relative dust emissions from coal that had been crushed to 2

inches versus 3 inches. We found that there was a notable reduction in coal dust emissions, about 30%, from the use of 3 inch coal. *See* Exhibit 5 at BNSF_COALDUST_0079736-42. We provided NCTA with the results of our study. I am not aware that the mines made any changes in their practices or that the shippers requested any changes in mine processes based on these study results.

BNSF advised NCTA members that its primary concern was that coal dust was contaminating the track structure, most importantly the track ballast, which could lead to an unstable track structure under circumstances similar to those in 2005. Some NCTA members speculated that the contaminants BNSF was finding in the rail ballast were attributable to brake dust released from rail car brake shoes rather than coal escaping from the coal cars. BNSF collected samples of contaminated ballast and samples of brake dust and carried out several analyses, including x-ray diffraction tests and infrared spectra analyses, to determine whether brake shoe dust was present in the ballast in significant quantities. These tests showed that the contamination in the ballast was attributable to coal dust and not brake shoe dust. *See* Exhibit 5 at BNSF_COALDUST_0079792-808. We presented the results of these studies to NCTA members.

Some NCTA members expressed skepticism that the coal that was accumulating on the right of way had come off of the top of loaded coal cars and they speculated that the problem of coal dust accumulation might instead be primarily attributable to coal leaking out of the bottom of bottom dump coal cars. Some coal cars used in the PRB are cars that are loaded from the top but release the coal at the utility destinations through outlet doors on the bottom of the car. If the bottom doors on these cars are not tightly closed when the cars are loaded, coal can escape through the bottom doors onto the right of way. To determine the relative amount of coal that is

lost through bottom dump cars we equipped several cars with fiberglass bins that collected the coal dust lost through the bottom of the car. *See* Exhibit 9. We concluded that on average, these cars lost about 12 pounds per 100 miles per car per trip. *See* Exhibit 5 at BNSF_COALDUST_0079788-89 (average of all values). BNSF and UPRR both took action by repairing their steel bottom dump rail cars to ensure adherence to maintenance standards for bottom dump cars and to minimize any losses of coal through the bottom of cars. BNSF also issued Coal Car Bottom Outlet Door System Validation Procedures to our mechanical rail car inspection teams to check bottom outlet door latches, to view outlet doors for gaps, to verify that the secondary lock is properly engaged, and to check primary lock indicators to see if they are damaged or need adjustment. If a defective door is identified, the car would be taken out of service and sent to the mechanical shop for repairs. *See* Exhibit 10; *see also* Exhibit 11.

We then compared the bottom dump losses with the loss of coal from the top of loaded cars. The amount of coal lost off of the top of a car could not be collected and measured directly, but we were able to make rough estimates of the coal losses from the top of loaded cars using lasers to measure the volume of coal in a car at the beginning of a trip and the volume of coal in the car at the end of the trip. This analysis basically measured the difference in the elevation of the coal in the car before and after the train moves a certain distance. Based on these analyses, we estimated that somewhere between 250 and 750 pounds per car are lost in transit. *See* Exhibit 8 at BNSF_COALDUST_0034962-66. We also found research carried out in Canada that concluded that as much as 2% of the total volume of coal in the rail car (2 tons from a 100 ton car) can be lost in transit. These are only rough estimates and more precise measurements could be made in the future of the amount of coal lost out of the top of cars as they move from the mines to the utilities. But the analyses on which these estimates are based make it clear that

substantial volumes of coal are blown out of coal cars in transit and that the volume of coal emitted from the top of coal cars substantially exceeds the amount of coal escaping from the bottom of the cars. We also presented the results of these analyses to NCTA.

Another issue raised by NCTA members was the availability of water near the mines for use in applying surfactants to loaded coal cars. Surfactants are usually delivered to the mines in a concentrated form and they need to be combined with water before being applied to the coal. There was a concern that inadequate supplies of water existed in the PRB to support widespread use of surfactants. Mark Murphy of CRA did a study of potential water sources. He found that while surface water resources were relatively scarce in the region, there were adequate sources of well water to support the use of surfacants. *See* Exhibit 5 at BNSF_COALDUST_0079809; *see also* Exhibit 12.

BNSF Determined That Coal Dust Emissions From Loaded Coal Cars Have To Be Curtailed.

As our analysis of the coal dust problem progressed, it became clear that the only effective and responsible way to deal with the problem was to substantially reduce coal dust emissions from loaded coal cars. The derailments and our further studies confirmed that coal dust emissions had to be substantially eliminated. Coal dust is a particularly serious contaminant of track ballast and poses serious challenges when it accumulates along rail lines such as those in the PRB that handle extraordinarily large volumes of coal traffic. Ballast is the layer of coarse granite aggregate on which the rails and ties rest. The track structure relies on ballast as the foundation of its structural integrity, very similar to a bridge span relying on the bridge abutments for its foundation. The purpose of railroad ballast is to provide drainage and structural support for the heavy loads that are transmitted to the ballast from the wheels of a heavy train on the rail, the rail on the tie plates or pads, the tie plates or pads on the ties and then ultimately to

the ballast. When the ballast is fouled by contaminants, its load bearing properties are adversely affected and the track structure integrity can become severely compromised. These problems are especially acute with coal dust which acts like clay and becomes "slimy" or slippery when wet, thereby compromising the interlocking capabilities of the individual granite rocks in the ballast. Wet coal dust further prevents the drainage of water out of the ballast section.

In 2006, BNSF commissioned a study by Professor Erol Tutumluer at the University of Illinois at Urbana-Champagne to examine the properties of fouled ballast. Professor Tutumluer had conducted preliminary tests on ballast collected at a derailment location in Nebraska and he proposed to expand his tests to include different types of ballast and different types of ballast contaminants, including coal dust. *See* Exhibit 13. Professor Tutumluer carried out his study and reported to BNSF his conclusion that coal dust was a particularly severe source of ballast fouling. He noted that while coal dust had not previously been identified as a significant ballast contaminant, in fact, it has characteristics that make it one of the worst fouling agents. He found that coal dust has a very high water holding capacity which limits drainage in ballast fouled by coal dust. His tests also showed that ballast contaminated by coal dust has a much lower load bearing capacity, which is an obvious problem for PRB lines that carry a greater volume and annual tonnage of freight than any other rail lines in the United States. Particularly when it gets wet, coal dust can have a highly destabilizing effect on rail ballast. *See* Exhibit 14. Since providing BNSF with the results of his study, Professor Tutmuluer has continued to examine the properties of coal dust and is submitting a Verified Statement to the Board in this proceeding on the character of coal dust as a ballast fouling agent.

Coal dust accumulates rapidly and in large quantities along the PRB rail lines. We have been surprised at the rate of accumulation. As explained by Craig Sloggett, BNSF's General

Director of Maintenance & Planning in his Verified Statement, we have found significant accumulations of coal dust on PRB lines to occur within as short a period as six months. In one area, we found that brand new track installed with clean materials from the native ground up to the track level had been contaminated with coal dust in a few months. On one bridge, we replaced the ballast materials in 2007 down to the concrete structure or tub that the ballast and track sits in, and we found in 2009 that the entire process needed to be repeated because of coal dust contamination all the way down to the bottom of the concrete tub. There were at least 12 inches of compacted ballast contaminated by coal dust all the way to the bottom of the tub. In 2008, we carried out a large coal dust clean-up exercise, focusing on coal that had accumulated above ground in creek beds, next to the tracks and along bridge abutments. We filled over 300 rail cars with the dust that had been collected and transported the coal to a landfill.

While the coal dust accumulates rapidly and visibly in some areas, it is often difficult to detect because it quickly makes its way down into the ballast. As Mr. Sloggett explains, on some sections of track that appear to be clean, coal dust can be right below the top rocks and further down below the surface. *See* Exhibit 15. This makes it difficult to carry out surgical maintenance of fouled ballast. Visual inspection of the rail bed cannot be relied on to locate areas where fouling has occurred. As a result, more widespread maintenance activity must be carried out to make sure problems do not develop. For example, on high volume rail lines, BNSF would expect to undercut the track structure generally on 10-year cycles. Undercutting involves removal and replacement of the ballast and locations are prioritized based upon condition. We are finding that in some areas on the Joint Line, undercutting may be needed as often as every two or three years.

This increased maintenance activity is not only costly, it also substantially reduces the capacity of the rail lines. Traffic must be slowed down to allow the maintenance activity to be safely carried out. In addition, BNSF is forced to carry out extraordinary inspection and track monitoring activity, particularly during rainy months, in an effort to detect problems caused by coal-fouled ballast before service is affected. While the additional inspection and monitoring activity is being carried out, the tracks cannot be used to provide service. With the severe winter weather in Wyoming, we are limited to performing our capital maintenance work in the summer or mild weather months, putting great pressure on capacity that is already strained.

It is not acceptable to operate the high volume PRB lines while constantly trying to play catch-up with the coal dust emitted from loaded rail cars. BNSF's approach is to proactively operate a safe and efficient railroad. The problem of coal dust is not one that can or should be dealt with through maintenance but has to be addressed by substantially eliminating the dust that is emitted onto the rail lines from loaded coal cars.

BNSF Has Taken the Steps Within Its Control To Curtail Coal Dust Emissions.

One of the first things that Dr. Emmitt noticed when he started working with BNSF in 2005 was that the profile of loaded coal in the coal cars had steep angles and irregular surfaces that made the coal susceptible to being blown off during transit. He had done studies for NS on the benefits of loading coal cars with a more aerodynamic profile and he recommended that the load profile of coal cars loaded at PRB mines also be changed. He provided us with an ideal load profile design for a rounded breadloaf shape. *See* Exhibit 16. This breadloaf shape took into account the natural angle of repose of the PRB coal, which is the slope that a coal pile would naturally take from the effect of vibration and wind through a train's movement. When the breadloaf angles match the natural angle of repose at the beginning of the trip, the coal is less

likely to blow off of the top of the car during the trip, since the coal is already in its natural angle of repose.

Some NCTA members were concerned that modifying the load profile would reduce the amount of coal that could be loaded into the coal cars. They were also concerned that the load profiling would increase the time to load a train. SWA did laser analyses of loaded coal cars and showed that use of a more aerodynamic load profile would simply redistribute the coal within a car without reducing coal volumes. It was evident that in poorly loaded cars there were air pockets in the back and front of the rail car where coal could be redistributed without reducing the loading volumes. We determined that a modified loading chute design could be used by the mines to produce a more aerodynamic load profile. *See* Exhibit 17. We starting working with one mine to test the new loading chute and we found that it improved the load profile without impeding the loading process. This mine also confirmed that it could load the coal into the train without adversely increasing loading time. We then worked with the other PRB mines to persuade them to use the improved loading chutes. *See* Exhibit 18.

Changing the load profile reduces coal dust emissions, but the precise extent of the reduction is uncertain. Data from the dustfall collectors suggests that the reduction in coal dust that has resulted from modified loading profiles has been in the range of 15% to 20%. *See* Exhibit 19 at BNSF_COALDUST_0064122. One reason for the limited benefits we have seen is that the use of a modified loading chute alone does not guarantee that the ideal load profile is achieved. The loading operator plays an important role in loading cars with the proper profile, and we have found that sufficient care is not always given to the loading process. In an effort to improve loading practices, SWA has established a Coal Car Load Profiling System ("CCLPS"), which uses lasers to read the loading profile of a car shortly after it has been loaded and allows

us to give immediate and reliable feedback to mines on the profile of the loaded cars. *See* Exhibit 20. Even if loading practices were perfect, improved loading would not eliminate the majority of coal dust emissions.

Another early and effective step that BNSF has taken to reduce coal dust was the overhaul and enhanced maintenance of bottom dump coal cars in BNSF's car fleet to reduce dusting from the bottom. As noted above, our analyses showed that substantially more coal was being lost from the top of loaded coal cars than from the bottom of bottom dump cars. However, coal losses from those bottom dump cars were significant and cannot be ignored. Therefore we instituted a multi-year program to expand the inspection and repair of the older fleet of bottom dump steel cars. Car doors have been tightened and adjusted and gaps or holes in the bottom of the cars have been caulked shut. New maintenance practices have been instituted to ensure proper operation of the bottom dump doors as described previously.

Further Reductions In Coal Dust Emissions Can Only Be Achieved Through Shipper Compliance With the Coal Dust Emissions Standards that Are the Subject of this Proceeding.

The improved loading of loaded coal cars and the enhanced repair and maintenance of bottom dump rail cars addresses only a small part of the coal dust problem. Effective curtailment of coal dust must include strict limits on the emission of coal from the top of loaded coal cars. BNSF does not load coal cars and the freight loaded into the cars does not belong to BNSF. The steps necessary to limit coal dust emissions from the top of loaded coal cars must be taken by the shippers and the mines. No shipper of any other commodity is allowed to release their commodity onto BNSF's rail lines or property and to create the risk of serious service disruptions by contaminating the rail ballast. BNSF has no interest in dictating how the shippers and the mines choose to limit coal dust emissions. BNSF's only interest is in substantially

eliminating the coal dust emissions. Indeed, by leaving to the shippers and mines the flexibility to address the issue of coal dust emissions as they see fit, BNSF believes that competition and market forces will lead to the adoption of the most efficient and cost-effective remediation approaches for the shippers and the mines.

The most obvious way to eliminate coal dust emissions from loaded cars would be to cover the loaded cars with tops. If the shippers and their mine agents were currently covering all loaded coal cars, no coal dust emission standard would be needed. The use of car tops would effectively eliminate the coal dust problem. But BNSF realizes that significant costs might be involved in converting to the use of car tops. Moreover, other technologies may become available that could generate the same benefits as car tops with less cost. Therefore, BNSF chose to adopt an emissions limit instead of prescribing any particular coal dust suppression approach. This gives shippers and their mines the freedom to adopt the measures they believe will be the most efficient and cost effective in meeting the emissions limit.

The coal dust emissions standards at issue in this proceeding and the process of adopting them are described in detail in the Verified Statement of Charles Sultana. Mr. Sultana is an expert in the Six Sigma methodology, which is a process for solving business problems that relies heavily on facts and data. As explained above, BNSF had been collecting massive amounts of data on coal dust emissions since 2005. In particular, since September 2005, the TSM set up at Milepost 90.7 had been collecting train-specific data on coal dust emissions on all trains passing that milepost. When Mr. Sultana joined BNSF in 2006, Mr. Sultana was asked to help understand and evaluate the data being collected. I subsequently asked Mr. Sultana to bring his data analysis skills to bear on identifying a coal dust emissions standard which, if met by all

trains passing Milepost 90.7, would substantially eliminate coal dust emissions at that point on the Joint Line.

The adoption of a coal dust emission standard applicable to trains passing a particular milepost flows from the practical requirements of measuring coal dust from moving trains at a fixed location. It is analogous to the use of a traffic policeman to enforce speed limits on a long stretch of highway. As a practical matter, the traffic policeman must choose a spot and measure speed from that spot only. There can be no assurance that a car exceeding the speed limit at the measurement location actually was speeding on other sections of the highway or that a car below the speed limit at that location had never exceeded the speed limit on other sections of the highway. But the practical limits on enforcement require that enforcement efforts be limited to a single location. Those same practical factors required that we develop a standard applicable to Milepost 90.7, which was where the equipment used to measure coal dust emissions was located for the Joint Line and where the data on coal dust emissions had been gathered since September 2005.

Mr. Sultana started with the train-specific data for trains passing Milepost 90.7 from September 2005 through August 2007. As described by Mr. Sultana and Dr. Emmitt, SWA had used the data collected by the electronic dust monitors on the TSMs to identify an "Integrated Dust Value" or "IDV" for each passing train. The IDV was a measurement of the number of coal dust units emitted by the train when passing Milepost 90.7. By August 2007, SWA had improved on the calculation of the IDV and was now using an improved form called IDV.2. *See* Exhibit 21. Mr. Sultana added together all of the IDV.2 units associated with the trains passing Milepost 90.7 from September 2005 through August 2007 and identified the IDV.2 value which, if it had not been exceeded by any of the passing trains during that time period, would have

eliminated 95% of the total dust units emitted by the passing trains. The value he identified was an IDV.2 of 134.

As Mr. Sultana explains, he also found that the e-sampler dust monitors used on the TSMs produced somewhat varying IDV.2 readings on the same air sample of coal dust. This variation is unavoidable given the equipment being used, but Mr. Sultana concluded that it could be addressed by setting a maximum IDV.2 level that takes account of the variation through accepted statistical techniques. Mr. Sultana identified the range of variability and concluded that a train producing coal dust at an IDV.2 level of 134 could produce an IDV.2 reading on another dust monitor of as much as 300. Therefore, to be sure that trains producing 134 or less would not be found to violate the IDV.2 standard, he set the maximum IDV.2 standard to 300. *See* Exhibit 22. As Mr. Sultana explains, the standard is very conservative. Mr. Sultana performed the same analysis using data that had been collected at Milepost 558.2 on BNSF's Black Hills Subdivision and set a maximum IDV.2 level of 245.

When SWA provides BNSF with IDV.2 data on trains passing the TSM, SWA excludes trains where the dust reading might not be properly attributable to the train, for example when the train passed the TSM just as another train was passing on a parallel track. We found that in 2009 almost 14% of trains passing Milepost 90.7 for which there were usable IDV.2 data exceeded the IDV.2 standard. However, this does not mean that only 14% of the PRB coal trains are emitting large amounts of coal dust on the PRB lines. It means only that 14% of the PRB trains are emitting coal at levels above our performance standard at the specific point where the TSM is installed. Coal dust emissions from moving coal trains are highly episodic. A loaded coal train could pass Milepost 90.7 with no coal emissions only to emit a large plume of coal dust a mile or less away. Tests we carried out using instrumented trains show that episodes of

dusting occur all along the PRB rail lines. *See* Exhibit 23. Our monitoring efforts are limited by the practical need to set up monitoring devices at a fixed location. However, we are confident that if the shippers and mines take action that is sufficient to substantially eliminate coal dust emissions at Milepost 90.7, those same efforts will result in the substantial elimination of coal dust along the entire Joint Line and Black Hills Subdivision lines. For example, if the shippers and mines adopt surfactant programs that limit coal dust emissions at Milepost 90.7 on the Joint Line and Milepost 558.2 on the Black Hills Subdivision to the levels specified in the standards at issue here, BNSF is confident that coal dust throughout the PRB will be eliminated.

BNSF Has Conducted Substantial Testing of Surfactants That Yields Promising Results.

Surfactant application is a well established way to reduce coal dust emissions from coal cars in transit. *See* Exhibit 24. I understand that NS has successfully used surfactants to curtail emissions and that surfactants are also used in Canada. Surfactants can be used to create a crust or artificial lid that keeps coal dust in the car. Other surfactants create an adhesive coating that causes coal particles to stick together. There are several different coal surfactants available on the market today with a range of characteristics.

BNSF began testing surfactants even before the derailments in 2005 as a means of reducing coal dust emissions. After retaining SWA, we expanded substantially our testing of surfactants. SWA conducted laboratory tests on dozens of products for characteristics likely to reduce or eliminate coal dust emissions. SWA did tests on the erosion properties of treated coal, the effect of rain simulation, solar heat, wind, curing time, penetration depth, static strength, and freeze recovery. BNSF tested numerous products to ensure that products used in field tests would not corrode railcars, were not harmful to handle, and were non-hazardous to field personnel. One of BNSF's coal shippers tested surfactants in its laboratory to make sure the

surfactants were not harmful to a utility's boilers. Through these tests, we identified numerous promising surfactant products and set up field tests on the effectiveness of those products.

I have described above the instrumented trains that use RTEPS/PCs that monitor ambient conditions and coal losses throughout an entire route of movement. Beginning in 2005, we used those trains to test the effectiveness of various surfactants. We generally set up the trains so that the RTEPS instruments were mounted onto one of the last cars on the train. The RTEPS would allow us to monitor conditions like wind speed, humidity, or rainfall that might have an impact on the effectiveness of a particular surfactant. Then, with the shipper's permission, we would divide the train into groups of treated and untreated cars and mount PCs on the rear sill of the last car in each group. We would then collect and weigh the dust collected in the PCs to determine the effect of surfactant treatment on the loss of coal from the car. Based upon the testing and evaluations we have completed, we are confident that proper application of a quality surfactant onto a properly profiled loaded coal car can reduce coal dust emissions from the rail car top by more than 85%.

When BNSF extended the effective date of its Rules Publication 6041-B, items 100 and 101, in October 2009, BNSF announced, in response to requests from our shippers, that it would conduct a large-scale trial of dust mitigation methods, focused on surfactants, to give shippers and the mines further opportunities to assess potential remediation measures. The trial, which is currently underway, will give shippers and the mines an opportunity to test various products and to assess their effectiveness in reducing coal dust emissions. *See* Exhibit 25. Products are selected for the trial only if they first pass the SWA laboratory analysis showing that the products have promising dust suppression characteristics and the BNSF tests showing that they are not harmful. There is a selection committee consisting of shippers and mines that will determine

which products to test after the initial testing of two products is completed. We are conducting field tests using the RTEPS/PCs described above. Testing is conducted on trains that are half-treated, leaving the other half untreated as a control, and performance reports on each train tested are sent to all the trial participants. We are also monitoring the dust emissions from passing trains using the TSMs and providing the IDV.2 data generated by the dust monitor on the TSMs to the participants in the trial. The trials are expected to run until the end of August 2010, and the total tonnage to be tested is 36.2 million tons. BNSF is confident that the data generated in the current trial will give shippers and the mines information that will allow them to make informed decisions regarding what measures they should adopt to achieve compliance with BNSF's coal dust emissions standards.

I declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

Executed on March 15, 2010

William VanHook

VERIFIED STATEMENT OF CRAIG SLOGGETT

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35305

PETITION OF ARKANSAS ELECTRIC COOPERATIVE
FOR A DECLARATORY ORDER

VERIFIED STATEMENT OF CRAIG SLOGGETT IN SUPPORT OF
BNSF RAILWAY COMPANY'S OPENING EVIDENCE

I am Craig Sloggett, General Director, Maintenance for BNSF Railway Company ("BNSF"). My office is located in Gillette, Wyoming, and I have responsibility for the overall maintenance and maintenance planning on BNSF's Powder River Division, which territory includes all of the BNSF coal routes into and out of the Powder River Basin ("PRB"), including both the Joint Line and the Black Hills Subdivision. In this capacity, I oversee two Division Engineers who are responsible for the entire Powder River Division and all engineering personnel under their supervision. Further, I am responsible for the maintenance of the signal, bridge and other property of the BNSF on the Powder River Division, exclusive of mechanical and communication facilities.

The purpose of my verified statement is to convey from my firsthand experience the magnitude of the coal dust problem on the Joint Line and Black Hills Subdivision and the impact that coal dust is having on the railroad. I will also explain why, from the perspective of BNSF's maintenance-of-way efforts, it is essential to limit emissions of coal dust from railcars.

I have worked for BNSF or its predecessor, the former Burlington Northern Railroad, for 32 years, during which time I have held a variety of positions with responsibility for railroad engineering and maintenance. I began my career in 1978 as a track laborer. After holding

various front-line maintenance jobs, I became a supervisor, first as Assistant Roadmaster and then as Roadmaster. In the early-to-mid 1990s, I was the Roadmaster responsible for the line from Gillette, Wyoming to Edgemont, South Dakota on the Black Hills Subdivision, which is one of BNSF's primary coal routes leading to and from the PRB coal mines. I was later promoted to various capital planning positions and eventually became a Manager of Gangs with responsibility for all maintenance gangs across four of BNSF's Divisions. In 1998, I became a Division Engineer overseeing all maintenance-related personnel for BNSF's Southwest Division. This Division includes the New Mexico portion of the high density BNSF intermodal route between Los Angeles and Chicago (referred to as the "transcon"), as well as several New Mexico coal mines served by BNSF. In 2007, I became Division Engineer for the Powder River Division with responsibility for overseeing all maintenance-related personnel for that Division. Later in 2007, I was promoted to General Director, Maintenance for the Powder River Division, which is the position I currently hold.

Coal Dust is Accumulating at Alarming Rates and Threatening Track Stability.

My first position in the PRB was as Roadmaster on the Black Hills Subdivision in the early-to-mid 1990s. At that time, small amounts of coal dust were visible in certain parts of my territory but the coal dust did not accumulate in quantities that had a significant or adverse impact on track integrity. When I returned to the area in 2007 as Division Engineer, I was shocked by the amount of coal dust accumulating in the ballast, on the track, and on the railroad right of way on both the Black Hills Subdivision and the Joint Line. I recall my first trip to the Powder River Basin in my new position in 2007. I was driving alongside the Joint Line track near Nacco Junction. I saw ahead of me on the track the headlight of the lead locomotive on a loaded coal train encircled in a cloud of black dust. This is a regular occurrence on the Joint

Line and Black Hills Subdivision. I have experienced on many occasions the feeling of being pelted with coal particulates when standing on the railroad right of way while a loaded coal train passes by. When I park my white truck along the coal routes, it becomes covered in black coal dust from passing trains.

Since my return to the Powder River Division, I have seen firsthand the extent to which the accumulation of coal dust causes damage to the railroad infrastructure, in particular, to the ballast that is so critical to permitting moisture to drain away from the railroad ties and track. When ballast becomes fouled with coal dust and cannot drain properly, it begins to break down, lose its stability, and allow railroad ties to break and/or the track to move out of alignment, which can lead to train derailments if not repaired. These are unsafe conditions that require the imposition of a slow order or speed restriction until appropriate maintenance can be performed or, in some cases, require the track to be taken out of service altogether so that necessary repairs can be made immediately so that the affected area may provide for the safe passage of trains again. For example, in May 2008, our inspectors imposed 25 mph slow orders on multiple sections of track between MP 90.5 and 103.6 that were severely fouled with coal dust until track windows could be scheduled to perform undercutting to clean and replace fouled ballast. In October 2007, when we discovered a section of track near MP 75.3 with extensive ballast contamination, we lowered the track speed limit from 50 mph to 25 mph until the track could be taken out of service for undercutting. These are only two examples of numerous slow orders and track windows required to address the accumulation of coal dust and its effects on the track structure.

During seasons of high precipitation, particularly though not exclusively in the spring and summer, railroad track structure is particularly vulnerable to moisture. In the spring in

Wyoming, the frozen ground begins to thaw, releasing moisture. During the spring thaw, we typically experience snow and rain, which adds to the moisture level in the ground. When railroad ballast is fouled with coal dust, it is unable to serve its primary purposes of allowing moisture to drain away from the track and supporting the track structure. Heavy rain or snow can quickly overwhelm the ability of fouled ballast to drain water away from the track. Summer rains can cause the same problem. Pictures illustrate the effect of coal dust and moisture on ballast most effectively. *See* Exhibits 1-3. Track structure with fouled ballast deteriorates very quickly in wet conditions. I have seen sections of track that appear to be in sound structural condition and then, within 24 hours of a precipitation event, a portion of the track begins to dip or sink, as the ballast below it retains water and begins to give way.

Fouled ballast can be difficult to detect. In some instances, the presence of mud or other moisture and the accumulation of coal dust may indicate to track inspectors that ballast may be fouled. In other instances, there are no obvious visible signs, as most railroad ballast is hidden within the track structure and only the rock on top is visible. On the Joint Line, ballast must extend a minimum of 12 inches below the bottom of concrete ties and it is difficult to see into the ballast beyond the first inch or two without digging into the ballast itself. Exhibit 4 contains a picture of track that appeared to be in good working condition on the surface. However, when BNSF engineering personnel dug into the ballast, they discovered extensive coal dust contamination several inches below the surface.

Coal dust accumulation on the track (e.g., on the tie plates, on top of the bottom flange of the rail, and on the ties) and on the right of way is more visible than coal dust accumulation in ballast and therefore easier to detect. Even though visible, such accumulation may also cause significant problems for the railroad. For example, coal dust accumulation on the track interferes

with the proper inspection of ties and rail by BNSF engineering personnel and is likely to work its way into the ballast. When coal dust accumulates at switch locations, over which a train switches from one track to another, it can impede the proper working of switches, ignite from the heat generated by railroad heaters used to keep the switches from freezing in the winter, and, due to increased vibration from a train passing through a switch, coal dust can vibrate down into the lower levels of the ballast section supporting the switch, taking moisture with it when wet. *See, e.g.*, Exhibit 1. Coal dust fires burn and smolder for long periods of time and can be very difficult to extinguish, particularly when they are fueled by large amounts of coal dust, both on and off the track. When coal dust accumulates on the right of way, it can also catch fire and burn for miles along the track.

The coal dust problem today is quite evident from the visible accumulation on both the Joint Line and Black Hills Subdivision. The accumulation I have experienced in the last three years far exceeds the minor accumulation that I saw while working on the Black Hills Subdivision 15 to 20 years ago. It is a constant battle to remove coal dust from the track and surrounding areas and to repeatedly clean ballast across the territory that has become severely fouled with coal fines. Below are a few examples of the very rapid accumulation of coal dust emitted from passing trains:

- In the early spring of 2009, we undercut a fouled section of track ballast near MP 90.5. In October of 2009, we undercut a section next to the one undercut in the spring and purposely overlapped the prior track ballast. The new "clean" ballast from that section was already severely fouled with coal dust in just a few months. *See* Exhibit 1.

- BNSF recently constructed additional main line track on the Joint Line. In some locations the Joint Line now consists of three main lines (triple track) and in other locations the Joint Line consists of four main lines (quadruple track). For new track construction, BNSF first prepares the subgrade and then

places the subballast, ballast, ties and track along the new segment, without switches. Once the track is complete, BNSF then installs switches in the new track, which involves removing small sections of newly laid track and ballast to insert switches that allow trains to travel from one track to another. When we installed a switch in new quadruple track at MP 74, we discovered that the new ballast installed just a few months earlier was already contaminated with approximately 3 to 4 inches of coal dust that had filtered down through the ballast. We uncovered similar contamination when we installed a switch at MP 33, where we had recently installed new triple track.

- In 2006, before my return to the Powder River Division, BNSF undertook extensive ballast replacement in switch locations on the Joint Line. In 2007, many of these switches were reballasted because they had already become severely fouled with coal dust.

BNSF is Undertaking Unprecedented Maintenance Efforts to Address Coal Dust Emissions.

BNSF has undertaken extraordinary maintenance efforts on the Joint Line and Black Hills Subdivision to combat the accumulation of coal dust and its adverse impact on the railroad. In 32 years of railroad maintenance across the BNSF system, I have never seen another territory that requires such extensive maintenance. BNSF performs a variety of extra work not performed elsewhere on its system to prevent coal dust accumulation and associated fouled ballast. This work includes efforts to identify potential track problems, to remove coal dust from the ballast, and to remove coal dust from the track and right of way.

During periods of high precipitation and moisture in the Powder River Basin, in particular snow, rain and ground thawing in the spring and rains in the summer, we augment normal track inspection efforts by bringing railroad officers and other engineering department employees from all over the system to the Joint Line and Black Hills Subdivision to ride trains 24 hours a day. These efforts are in addition to and serve to supplement the inspections performed by BNSF track inspectors assigned to this territory. BNSF further supplements its

manual inspections with mechanical inspections by a track geometry car and a Track Strength Testing, Analysis and Recording ("TrackSTAR") car, both of which make detailed measurements of the track and rail condition and report irregularities outside of acceptable criteria. The TrackSTAR car also applies thousands of pounds of horizontal force on the rails and measures the movement of the rails outward. During the spring and summer, BNSF has brought a track geometry car to the Powder River Division to run continuously across these critical line segments to assist in the early detection of deteriorating track conditions. No other territory on BNSF has made these extraordinary inspection efforts a standard part of its inspection program.

Undercutting is a ballast maintenance technique used by railroads that involves lifting the track and ties off the ballast, removing the underlying ballast, cleaning it, and replacing it with clean ballast. As Division Engineer in the Southwest Division, it was my experience that the ballast on the majority of the BNSF transcon route, which is a high density line used primarily for intermodal traffic, needed to be undercut once every 15 to 20 years, while certain limited sections might need to be undercut every 10 or more years. In my experience working in the Powder River Division over the last three years, we have determined that certain segments of the Joint Line must be undercut every 2 to 3 years as a direct result of coal dust accumulation in the ballast. Other segments of the Joint Line where the coal dust may not accumulate as quickly must be undercut at least every 5 to 6 years, at least three times as often as the majority of BNSF's high density transcon line through New Mexico that services only a small number of coal trains. Below are several examples of track segments for which BNSF has had to accelerate its undercutting program in order to address coal dust fouled ballast:

- In October 2007, we discovered that a section of track near MP 75.3 was severely fouled with coal dust and required

immediate undercutting. That section had just been undercut in the fall of 2005 following the May 14, 2005 Joint Line derailment of a BNSF train that occurred less than a mile from that location. *See* Exhibit 5.

- Also in October 2007, inspection revealed coal dust fouled ballast on the bridge at MP 62, near the site of the May 15, 2005 Joint Line derailment of a UP train. This location had been undercut in August 2005 but needed to be undercut again in 2008. *See* Exhibit 4.

- In May 2008, our inspectors identified sections of track between MP 90.5 and 103.6 that required immediate undercutting. This track had been undercut and reballasted in September 2005, just 31 months prior. BNSF had planned to undercut this section of track in 2009, but the planned work had to be moved up to 2008, just over 2.5 years since the last undercutting. The root cause of this additional maintenance was determined to be coal dust accumulation that had fouled the ballast. *See* Exhibit 2.

- In August 2008, inspection revealed that main track one on the bridge near Nacco Jct., which had been undercut three years ago that very week, was fouled with coal dust and needed to be undercut again. *See* Exhibit 6.

In addition to more frequent undercutting, BNSF currently performs another ballast maintenance technique called shoulder ballast cleaning on the entire Joint Line annually. This technique involves removing all ballast at the shoulder of the track, removing accumulated particulates and replacing it with clean ballast. In my position as Division Engineer on the BNSF transcon route in New Mexico, we found that undercutting the track approximately every 15 to 20 years was sufficient to maintain ballast integrity and that the additional maintenance of shoulder ballast cleaning was not required.

BNSF has also undertaken extraordinary efforts to remove coal dust from the track and from the right of way. BNSF employs a variety of extra measures not performed elsewhere on its system to remove coal dust. Vacuum trucks are regularly employed to vacuum coal from the track and, in particular, the switch areas. BNSF uses a badger ditcher, which is a machine that

runs on the track and has an attachment with a digging wheel that picks up coal dust that has accumulated between the tracks. BNSF uses front end loaders and motor graters to consolidate accumulated coal dust along the right of way into piles for disposal or to recycle the coal dust for use as road base on the access roads along the BNSF right of way.

In 2008, BNSF undertook a large scale effort to remove accumulated coal dust from portions of the Joint Line with the greatest accumulation. The coal dust was consolidated into piles totaling more than 28,000 tons and loaded into more than 300 rail cars for disposal at a landfill. This volume does not include coal dust that had been previously vacuumed or used as roadbase. BNSF is currently engaged in another effort similar in scope to that performed in 2008 to remove additional volumes of accumulated coal dust. Without significant reduction in coal dust emissions, I expect that we will need to perform such large scale removals on a regular basis going forward.

Both the Joint Line and Black Hills Subdivision are in operation 24 hours a day, 365 days a year. In order to perform the majority of its maintenance work, including undercutting, shoulder ballast cleaning, and most coal dust cleanup and removal, BNSF must slow or stop train traffic on the railroad line on or near where this work is being performed to ensure the safety of our workers and to ensure the safe passage of trains as we work on the track structure itself. To do so, BNSF may issue a slow order, restricting trains to a certain speed, or place a track window, during which time the track is out of service for maintenance, requiring trains to use other tracks as available. Wherever possible BNSF attempts to minimize the disruption that slow orders and track windows have on the flow of trains, but given that trains operate continuously around the clock, train delays are inevitable when the trains are slowed down or necessary track is taken out of service, thereby reducing the effective capacity of the railroad.

Conclusion

As described herein, BNSF performs extensive maintenance on the Joint Line and Black Hills Subdivision that is not required on its other line segments. These extraordinary efforts are necessary on these line segments to prevent failure of the track and underlying ballast, which is increasingly fouled with coal dust emitted from the continuous passing of loaded trains. As long as significant volumes of coal dust continue to be permitted to escape from trains, BNSF will face the risk of ballast fouling and resulting track instability. Due to the hidden nature of fouled ballast, there will always be the possibility that fouled ballast could go undetected. This risk of undetected fouled ballast underscores the need to address coal dust at the source by limiting emissions from loaded coal trains rather than attempting to clean up the coal after it has spilled out of coal cars.

I declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

Executed on March 15, 2010

Craig Sloggett

VERIFIED STATEMENT OF CHARLES SULTANA

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35305

PETITION OF ARKANSAS ELECTRIC COOPERATIVE CORPORATION FOR A DECLARATORY ORDER

VERIFIED STATEMENT OF CHARLES SULTANA IN SUPPORT OF BNSF RAILWAY COMPANY'S OPENING EVIDENCE

My name is Charles Sultana. I am a Six Sigma Specialist in the Mechanical Department of BNSF Railway Company ("BNSF"). As I explain below, the Six Sigma methodology is a process for solving business problems that relies heavily on facts and data. As BNSF's Six Sigma Specialist, I had primary responsibility for developing the specific coal dust emissions standards that are at issue in this declaratory order proceeding. As I explain below, BNSF's coal dust emissions standards are based on a large quantity of data collected and carefully analyzed over several years from the coal dust emitted by trains operating in the Powder River Basin ("PRB"). My responsibility was to analyze the data for purposes of identifying an achievable and conservative limit on coal dust emissions that would, if met by all shippers, substantially eliminate coal dust on the PRB rail lines. The purpose of my verified statement is to describe for the Board the development and logic of the emissions standards that I developed.

The Six Sigma Methodology

I was hired by BNSF in 2006 as a Six Sigma Specialist in BNSF's Mechanical Department. Since I arrived at BNSF, I have worked on projects in the Engineering and Mechanical departments as well as the Finance and Marketing departments. My primary

responsibility is to bring an advanced level of analytical and problem solving skills as developed and incorporated in the Six Sigma methodology to important problems identified by BNSF management. I was certified as a Six Sigma "Black Belt" in 2000, representing mastery of the Six Sigma methodology, and certified as a "Master Back Belt," the highest Six Sigma qualification level, in 2009. I have a Bachelor of Science degree in Mathematics from University of Texas at Arlington.

The Six Sigma methodology is a disciplined, data-driven methodology for eliminating defects and variation in any business system. The word "Sigma" represents the standard deviation within a population, i.e., the amount of variability within a defined population. The theory underlying the Six Sigma methodology is that if there are six standard deviations between the process mean (the average value of a given population) and the nearest specification limit (the upper or lower acceptable value), practically no member of the population will fail to meet specifications. The purpose of the Six Sigma methodology is to find ways to reduce variation in a given population.[1] The Six Sigma process is data intensive and relies heavily on statistical analyses.

When I arrived at BNSF, I was asked by Lisa Stabler, Assistant Vice President of Mechanical Quality and Reliability, to work with a group of BNSF employees and outside consultants that were investigating the problem of coal dust in the PRB. I was informed that large quantities of coal dust were being emitted from loaded coal cars moving on the Joint Line and on BNSF's Black Hills Subdivision and that coal was being deposited on BNSF's right-of-way, where it contaminated the rail ballast and created the risk of unstable track conditions.

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[1] For more information on the Six Sigma process, *see* Peter S. Pande et al., *The Six Sigma Way: An Implementation Guide for Process Improvement Teams* (2002) (general overview); American Society for Quality, http://www.asq.org/certification/six-sigma/index.html (last visited Feb. 25, 2010) (explaining certification courses).

Extensive data collection was underway to understand the scope of the coal dust problem. Ms. Stabler asked me to help understand and evaluate the data that were being collected.

Initial Efforts to Assess the Scope of the Coal Dust Problem

Shortly after being assigned the coal dust project, I went to Gillette, Wyoming, to investigate the physical properties of the coal in the Powder River Basin that made it susceptible to dusting. I examined the way the coal is mined, how it is stored, crushed, loaded, and transported and I took samples at different stages of the process. I measured the dustiness of coal at each stage to determine where coal dust appeared to be created. I concluded that the coal coming out of a mine's storage silo, where the crushed coal is kept prior to being loaded into empty coal cars, had substantially more dust than the coal entering the silo. It appeared that coal dust might be created in the silo by the shifting of coal as coal moved within and through the coal silo or that coal dust was accumulating in pockets within the silo and therefore deposited in large quantities in the cars during the loading process. We informed the mines of the results of these preliminary observations.

I also carried out various analyses of data being collected in the field by BNSF on coal trains in transit to determine whether it was feasible to isolate specific factors that caused dusting to occur on coal trains in transit. When I began working on the coal dust problem, BNSF was working extensively with Simpson Weather Associates ("SWA") to set up a data collection system relating to coal dust emissions. The data collection system that was being implemented had three parts. First, a network of dustfall collectors had been established at various locations along the PRB lines. These collectors measured the aggregate volume of coal dust that accumulated over a 30-day period of time at a specific location. The data from dustfall collectors therefore provided a broad overview of dustfall patterns over time. However, they did