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BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35557

REASONABLENESS OF BNSF RAILWAY COMPANY COAL DUST MITIGATION TARIFF PROVISIONS

BNSF RAILWAY COMPANY'S OPENING EVIDENCE AND ARGUMENT

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Pursuant to the Board's order of July 26, 2012, BNSF Railway Company ("BNSF") submits its opening evidence and argument in the above-captioned proceeding. As requested by the Board, this submission focuses on the reasonableness of the safe harbor provisions in BNSF's current coal loading rules.[1] As explained below and in the attached verified statements of BNSF's witnesses, there are compelling reasons for the Board to conclude that the safe harbor provisions of BNSF's Coal Loading Rule are a reasonable implementation of the Board's guidance in the prior proceeding relating to coal dust, *Arkansas Electric Cooperative Corporation – Petition for Declaratory Order*, Docket No. FD 35305 (STB served March 3, 2011) ("*Coal Dust I*").

The Board should act promptly to confirm the reasonableness of the safe harbor provisions. Uncertainty created by the pendency of this proceeding is delaying progress in bringing in-transit coal dust losses under control in the Powder River Basin ("PRB"). Most of BNSF's shippers are ready to implement BNSF's Coal Loading Rule, but many shippers are reluctant to undertake any coal dust mitigation measures while this proceeding is pending. Coal

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[1] BNSF's Coal Loading Rule is set out in Item 100 of BNSF's Price List 6041-B and Appendices A and B ("Coal Loading Rule"). The Coal Loading Rule is attached as Counsel's Exhibit 1.

dust creates serious risks to the safe and efficient transportation of coal in the PRB, and it is strongly in the public interest that shippers begin to take the cost effective and straightforward measures set out in BNSF's safe harbor provisions that will keep their coal in loaded coal cars.

I. INTRODUCTION

In *Coal Dust I*, the Board found that coal dust losses from loaded trains create a serious risk to the reliability of PRB coal transportation, which is a critical element in the Nation's energy supply chain. The Board also endorsed the principle that BNSF has the right to address the problem of coal dust losses from trains in transit by adopting reasonable coal loading rules that require shippers to take measures when loading trains to ensure that their coal remains in the loaded cars during transit. *Coal Dust I* at 11. The Board explained that a "cost effective safe harbor could go a long way to address our concern that the current tariff does not provide shippers with a certain method of compliance that does not depend on the monitoring system." *Id.* at 12. In adopting the safe harbor provisions of the new Coal Loading Rule, BNSF has implemented the Board's guidance.

Compliance with the safe harbor provisions in BNSF's new Coal Loading Rule is straightforward. First, shippers or their mine agents must groom the coal loaded in the railcars to a specified aerodynamic load profile. PRB mines have already installed appropriate coal loading chutes and have been performing coal load grooming with these new loading chutes for several years now. Second, shippers or their mine agents must apply one of several specified topper chemicals to the groomed coal. The topper agents form a pliable crust on top of the loaded coal that keeps coal dust from blowing out of the loaded rail cars in transit. The use of topper agents to control coal dust is well established. The approved topper agents, all of which are commercially available, were identified through field tests that involved extensive collaboration with and input from BNSF's coal shippers and PRB mines.

The measures that shippers must take to comply with the safe harbor provisions of BNSF's Coal Loading Rule are not unduly burdensome or costly. Compliance with BNSF's safe harbor will add only a small amount to the delivered cost of coal. The safe harbor actions will not interfere with current loading practices. Compliance with the safe harbor will not add substantially to the extensive measures already taken by PRB mines and shippers to control coal dust in other aspects of their operations. Until now, the only part of the process of mining, shipping, unloading, storing, and burning coal where shippers and their mines have not engaged in extensive coal dust control efforts is in the loading of coal cars, which directly affects coal dust losses in transit. Compliance with BNSF's Coal Loading Rule will fill this gap in coal shippers' coal dust management efforts and add only modest costs to the amounts that coal shippers must already incur to manage coal dust.

Most of BNSF's shippers have indicated that they understand the need to address coal dust and accept responsibility to adopt loading measures that will keep their coal in the loaded railcars. All PRB mines have adopted appropriate coal loading chutes, and a significant number of mines have already begun to apply topper agents to the loaded coal at the request of some shippers. Only a handful of shippers – some of whom are not even BNSF's shippers – have raised concerns about BNSF's Coal Loading Rule. BNSF explains below and in the attached verified statements that the concerns raised by this minority of shippers about different aspects of the Coal Loading Rule are unfounded. BNSF is concerned that these shippers are using the pending proceeding as a means of putting off for as long as possible their responsibility to deal with coal dust in the PRB. Unfortunately, the uncertainty created by the pendency of this proceeding is creating an impediment to progress even among shippers otherwise willing to move forward.

BNSF is confident that if the Board concludes, as it should, that the loading measures set out in the safe harbor provisions of BNSF's Coal Loading Rule are reasonable, there will be widespread compliance with BNSF's loading requirements. All major PRB mines are ready to implement the necessary loading practices, and they are just waiting for their customers to instruct them to comply with BNSF's loading requirements. BNSF therefore urges the Board to act promptly in this proceeding so that BNSF and its shippers can ensure the reliability of PRB coal transportation by controlling coal dust losses in transit.

BNSF's opening evidence and argument is supported by four verified statements:

- Stevan B. Bobb, BNSF's Group Vice President Coal Marketing, explains that the safe harbor provisions at issue here reflect BNSF's best efforts to comply with the guidance offered by the Board in *Coal Dust I* for the establishment of reasonable loading rules that will reduce coal dust losses in transit. Mr. Bobb also explains why the uncertainty created by this proceeding has made it difficult to achieve progress in bringing coal dust under control in the PRB.

- William VanHook, who is recently retired from BNSF as Assistant Vice President and Chief Engineer-Systems Maintenance and Planning, describes the studies and tests carried out in the PRB that led BNSF to adopt the specific approach to coal dust mitigation that is reflected in the safe harbor provision in BNSF's Coal Loading Rule. He further explains that compliance with the safe harbor will not impose substantial costs on coal shippers.

- E. Daniel Carré, Assistant Director of Simpson Weather Associates, and Mark Murphy, Vice President/Principal of Conestoga-Rovers & Associates, explain that the safe harbor measures set out in BNSF's Coal Loading Rule are straightforward, uncomplicated, and effective at reducing coal dust losses from railcars in transit.

- Randall Rahm, President of CoalTech Consultants, Inc., describes the extensive measures that PRB coal mines and coal shippers already take to control coal dust during coal production, processing and handling. He explains that there is no reason for coal shippers to avoid responsibility for loading coal so that the coal stays in the railcars in transit, which is the only part of the process of using coal to generate electricity where coal mines and shippers do not already take extensive measures to manage coal dust.

II. BACKGROUND

An extensive record was developed in *Coal Dust I* on the problem of coal dust in the PRB and the need to control coal dust losses through appropriate coal loading practices. The record in *Coal Dust I* contains substantial evidence of the pernicious effects of coal dust on the integrity of a railroad's track structure. Coal dust is a serious rail ballast contaminant. Rail ballast provides the structural support for the heavy loads moving over PRB rail lines and also provides for the drainage of water from under the tracks. When rail ballast becomes fouled with coal dust, its ability to support heavy loads is compromised. Coal dust absorbs water, expands when exposed to water, and acts as a lubricant. These properties make it a particularly harmful ballast contaminant that weakens and destabilizes track structure. Weakened track structure on PRB rail lines, which are among the highest density heavy haul rail lines in the world, can produce service interruptions that seriously disrupt the coal supply chain in the United States.

Indeed, the presence of coal dust in the ballast of PRB rail lines was a contributing factor to two back-to-back derailments in the PRB in 2005. The service disruptions resulting from those derailments and the subsequent work to repair the affected lines imposed enormous costs on BNSF and Union Pacific Railroad Company ("UP"), the joint owners of the PRB Joint Line, and on utilities that use PRB coal and their customers. Coal shippers estimated that the delays following the 2005 derailments cost them hundreds of millions of dollars.[2] Concerns raised by the 2005 derailments led to the establishment of the Rail Energy Transportation Advisory Committee ("RETAC") and to the Board's acknowledgment that it "views the reliability of the

[2] Congressional Research Service, *Rail Transportation of Coal to Power Plants: Reliability Issues* (Sept. 26, 2007).

nation's energy supply as crucial to this nation's economic and national security, and the transportation by rail of coal and other energy resources as a vital link in the energy supply chain." *Establishment of a Rail Energy Transportation Advisory Committee*, STB Ex Parte No. 670, slip op. at 2 (served July 17, 2007).

Without proper treatment of the loaded coal, coal dust is blown from trains in substantial quantities while they are on rail lines in the PRB. Counsel's Exhibit 2 includes several photographs submitted in *Coal Dust I* that illustrate the problem.[3] Coal dust blown from the loaded cars accumulates in deposits that can be seen along the entire PRB right of way. Moreover, while coal dust accumulates rapidly and visibly in some areas, it is often difficult to detect the presence of coal dust fouling because coal dust rapidly makes its way down into the ballast. Routine maintenance of the track ballast in the PRB consistently finds large amounts of coal dust in the ballast. *See* Counsel's Exhibit 3.

From 2005 through 2009, BNSF worked with consultants, coal shippers, shipper associations, and PRB mines to get a handle on the scope of the coal dust problem and to identify ways to substantially eliminate coal dust losses. BNSF has spent more than $6 million dollars on its study of in-transit coal dust losses since 2005. BNSF met frequently with shippers to share information that BNSF was developing on coal dust. The National Coal Transportation Association ("NCTA") was active on coal dust issues, and BNSF made numerous presentations to NCTA committees and carried out several tests and analyses at the request of NCTA.

Early in BNSF's efforts to understand the scope of the coal dust problem in the PRB and to identify potential solutions, BNSF identified two promising approaches that could be used in

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[3] The photographs in Exhibit 2 were included on the CD filed with BNSF's Rebuttal Evidence and Argument in the materials for the Verified Statement of William VanHook in *Coal Dust I*.

tandem to control coal dust losses from loaded railcars. Specifically, BNSF found that coal dust could be managed through a two-pronged strategy in which loaded coal would be groomed to an aerodynamic profile and then treated with chemical agents applied to the surface of the coal. Preliminary tests showed that proper grooming of loaded coal reduced coal dust losses, but the benefits were limited. However, when a topper agent was applied to the groomed coal, BNSF found that coal dust losses could be substantially reduced. Preliminary tests showed that over 90 percent of the coal dust losses from untreated cars could be eliminated by applying a topper agent to properly groomed coal loads.[4] Consultants hired by coal shippers similarly concluded that a two-pronged approach involving coal load grooming and the application of a topper agent could substantially reduce coal dust losses.[5]

While BNSF's preliminary studies showed that there were specific measures that could be taken by shippers and their mine agents to control coal dust losses from loaded cars, BNSF's first coal loading rule, which was the subject of *Coal Dust I*, did not prescribe specific actions to be taken to curtail coal dust losses in transit. BNSF wanted to give shippers flexibility to choose how they would manage coal dust. Therefore, BNSF's original coal loading rule was based on a performance standard, *i.e.*, it established a limit on the amount of coal dust that could be lost from a loaded train in transit and left shippers and their mines to decide what steps to take to meet the coal dust limit. Under BNSF's original rule, BNSF proposed to assess the compliance of individual trains with the coal dust performance standard using electronic measurement devices located at fixed points along the PRB right of way. BNSF believed that a performance-

[4] Verified Statement of William VanHook in Support of BNSF's Opening Evidence, *Petition of Arkansas Elec. Coop. Corp. for a Declaratory Order*, STB Fin. Docket No. 35305, Ex. 5 at 48-49 (filed Mar. 16, 2010) ("*Coal Dust I*, VanHook Op. VS").

[5] The shippers' tests are discussed in the Verified Statement of Mr. VanHook and the Verified Statement of Messrs. Carré and Murphy.

based standard, such as its original rule, that did not prescribe specific measures to be taken would provide favorable market-based incentives for shippers, mines, and other parties to come up with the least expensive, effective means of controlling coal dust.

In *Coal Dust I*, the Board acknowledged the serious risk that coal dust fouling created for the integrity of PRB coal transportation and the need to manage coal dust through appropriate loading practices. However, the Board did not accept BNSF's use of a performance-based approach to controlling coal dust. Under a performance standard, compliance was based solely on monitoring that took place after the loaded train left the mine. The Board was concerned that under such an approach,

> [s]hippers cannot be certain of effective compliance with this tariff. After the loading has taken place, the shipment is under the control of the railroad and subject to the vagaries of wind, weather, train speed, and track conditions. . . . [L]acking some sort of safe harbor provision, no shipper can ever be confident that any particular movement it tenders will be in compliance.

Coal Dust I at 14. The Board further stated that "[a] cost effective safe harbor could go a long way to address our concern that the current tariff does not provide shippers with a certain method of compliance that does not depend on the monitoring system." *Id.* at 12.

While the Board's decision in *Coal Dust I* was pending, BNSF continued its efforts to identify effective coal dust remediation measures. In 2010, BNSF conducted extensive field trials in the PRB to test the effectiveness of topper agents. BNSF also tested the effectiveness of other possible coal dust remediation approaches, including the use of certain "body treatments" of the loaded coal and compaction of the loaded coal. Technical support for these field trials, known as the Super Trial, was provided by BNSF's consultants, Simpson Weather Associates and Conestoga-Rovers & Associates. Shippers participated extensively in the Super Trial and took the lead on the selection committee which decided what topper agents should be selected for testing.

The results of the Super Trial confirmed BNSF's previously formed belief that the combination of coal load grooming and application of topper agents would be an effective means of coal dust remediation. Relying primarily on tests of dust dispersion using passive collectors attached to loaded coal cars, BNSF compared the levels of dusting on treated versus untreated cars. BNSF concluded that three of the topper agents tested in the Super Trial had been shown to be effective in reducing coal dust emissions by 85 percent or more.

Following the Board's *Coal Dust I* decision, and relying on the results of the Super Trial, BNSF developed a new coal loading rule designed to address and resolve the concerns the Board had expressed about the rule at issue in *Coal Dust I.* That new rule, which is the subject of this proceeding, retained the basic objective of BNSF's original coal dust rule, namely that coal dust losses in transit need to be reduced by at least 85 percent. However, BNSF followed the Board's guidance that the rule should include an activity-based safe harbor that would enable coal shippers to know when they load coal whether they are in compliance with BNSF's coal dust mitigation requirements. On July 14, 2011, BNSF published the new Coal Loading Rule. As explained in more detail below, the safe harbor provisions in the new Rule are based on the two-pronged approach to coal dust mitigation – grooming and topper application – that BNSF had identified early in its study of coal dust. In response to the Board's concerns in *Coal Dust I*, the new rule identifies specific and straightforward actions that shippers and their mine agents can take when loading their coal that will ensure compliance with BNSF's coal loading requirements. The safe harbor provision of the new Coal Loading Rule also allows shippers and their mines to propose alternative approaches, consistent with BNSF's longstanding desire to encourage marketplace innovation in coal dust mitigation.

In response to BNSF's new Coal Loading Rule, WCTL filed a petition on August 12, 2011, requesting that the Board reopen the record in *Coal Dust I*, institute industry-wide mediation, and stay or enjoin the effective date of the new Coal Loading Rule pending Board-supervised mediation. On August 31, 2011, the Board denied WCTL's request to stay or enjoin the new Coal Loading Rule, finding that there was no evidence that PRB coal shippers would suffer irreparable harm if the new rule was allowed to go into effect. Several weeks later, on November 22, 2011, the Board issued an additional decision denying WCTL's request to reopen the record in *Coal Dust I*. The Board concluded that WCTL had offered no valid reason to reopen *Coal Dust I* and reexamine issues that the Board had already considered in detail and resolved in that proceeding. The Board also rejected WCTL's request for industry-wide mediation, finding that WCTL had not identified a specific conflict that was appropriate for mediation.

While the Board denied the relief sought by WCTL, the Board noted that the reasonableness of the safe harbor provision that BNSF had adopted in its new Coal Loading Rule was an issue of broad importance in the industry. The Board therefore initiated this proceeding to "consider the reasonableness of the safe harbor provision in the new tariff." *Reasonableness of BNSF Ry. Co. Coal Dust Mitigation Tariff Provisions*, STB Docket No. Fin. Docket No. 35557, at 4 (served Nov. 22, 2011). The Board subsequently emphasized that this proceeding is limited to the issue of the reasonableness of the safe harbor provision and that the Board will not revisit issues already decided in *Coal Dust I*. *Reasonableness of BNSF Ry. Co. Coal Dust Mitigation Tariff Provisions*, STB Fin. Docket No. 35557, at 2 (served Mar. 5, 2012).

As explained in detail below and in the accompanying verified statements, the safe harbor provisions of the Coal Loading Rule reasonably implement the Board's guidance in *Coal Dust I* using an approach to coal dust mitigation that has been demonstrated to be effective. The Board should promptly issue a decision affirming the reasonableness of BNSF's safe harbor provisions and make clear that it expects shipper compliance with the Coal Loading Rule.

III. ARGUMENT

BNSF followed the Board's guidance in *Coal Dust I* and adopted a safe harbor in its Coal Loading Rule that will allow shippers to know when they load their coal whether they will be in compliance with BNSF's coal loading requirements. The measures that must be taken to ensure compliance are straightforward, cost-effective and commercially available. PRB coal shippers have no valid reason for putting off any longer the efforts they must take in loading coal to ensure that their coal will remain in the railcar during transit. The Board should find that the safe harbor provisions in BNSF's Coal Loading Rule are a reasonable means of dealing with the serious problem of coal dust.

A. The Reasonableness Of The Safe Harbor Provisions Should Be Assessed Based On The Board's Factual And Legal Findings In *Coal Dust I*.

The Board reached several conclusions in *Coal Dust I* that provide the framework for assessing the reasonableness of the safe harbor provisions at issue here. First, the Board concluded in *Coal Dust I* that coal dust fouling is a serious problem in the PRB that must be addressed. The Board expressly "conclude[d] that coal dust is a particularly harmful contaminant of ballast that requires corrective action." *Coal Dust I* at 7. Based on studies conducted by the Federal Railroad Administration ("FRA"), the Board found that "coal dust interferes with track stability to a much greater extent than other contaminants in the PRB . . . .

[C]oal dust's high volume relative to its weight and high moisture-absorbing capacity make it a unique problem." *Id.* The Board concluded that the characteristics of coal dust, and the prevalence of coal dust along the PRB right of way, create serious risks for the integrity and efficiency of PRB coal transportation. "[T]he evidence shows that coal dust is a harmful foulant that could contribute to future accidents by destabilizing tracks." *Id.* at 8. "Clearly, this is a problem that must be addressed." *Id.* at 14.

The Board also concluded that railroads may address the coal dust problem through reasonable loading rules that will result in the coal remaining in the cars during transit. The Board rejected outright suggestions by coal shippers that BNSF should be required to deal with the problem of coal dust through expanded maintenance of the right of way. The Board concluded that containment, not after-the-fact maintenance, was the proper way of dealing with coal dust. Even if after-the-fact maintenance could address the serious risks of coal dust in the rail ballast, which BNSF showed was not the case, "[i]t is inefficient for railroads to move cars loaded in a manner that routinely results in the release of coal dust during transport." *Id.* at 14. To ensure that a shipper's coal remains in the cars during transit, the Board "conclude[d] that BNSF and other coal carriers have the right to establish coal loading requirements, subject to the reasonableness requirement of 49 U.S.C. § 10702." *Id.* at 11.

The narrow issue in this proceeding is whether the loading measures set out in the safe harbor provision of BNSF's Coal Loading Rule are reasonable. The Board in *Coal Dust I* rejected BNSF's previous coal dust rule because that rule did not specify *any* loading activities that would ensure compliance with BNSF's coal dust mitigation requirements. BNSF's previous rule was based on a performance standard that identified the maximum amount of coal dust that a loaded train could generate as the train passed by monitoring stations located along the PRB right of way. Compliance with BNSF's rule was determined exclusively by the performance of individual trains as measured by the electronic monitors. The specific measures taken by a shipper or the shipper's mine agent in the loading process were not taken into account in determining whether the shipper was in compliance with BNSF's loading rule. The Board found that this approach was not reasonable because shippers would not know when they loaded the rail cars whether they were in compliance with BNSF's rule. Compliance would not be determined until the train passed the monitoring stations, after the train had left the shipper's control.

BNSF had a valid objective in establishing a performance-based standard that left the shippers free to determine what measures they would take to comply with BNSF's coal dust requirements. BNSF believed that a performance-based standard would give shippers maximum flexibility and create incentives in the market for shippers, mines and third parties to explore and develop a range of coal dust mitigation approaches. While the Board agreed that "[s]hippers and railroads should have flexibility to create incentives to experiment with new methods that could later prove to be better," *Coal Dust I* at 6, it concluded that the uncertainty for shippers that tried to comply with BNSF's rule was the key factor in assessing BNSF's rules. The Board believed that shippers need to know when they load the cars whether they will be in compliance with BNSF's requirements. As the Board explained, "lacking some sort of safe harbor provision, no shipper can ever be confident that any particular movement it tenders will be in compliance." *Id.* at 14.

The Board indicated that the problem of shipper uncertainty that was fatal under the prior rule could be eliminated by the establishment of a safe harbor. "Under a safe harbor, shippers that use an approved emission control method contained in the tariff would be considered in compliance with the tariff, regardless of monitoring system results." *Coal Dust I* at 12. The Board went on to say that "[a] cost effective safe harbor could go a long way to address our concern that the current tariff does not provide shippers with a certain method of compliance that does not depend on the monitoring system." *Id.*

As explained below, BNSF followed the Board's guidance and adopted an activity-based safe harbor provision that identifies specific loading measures that shippers can take to ensure that they are in compliance with BNSF's coal dust mitigation requirements.

B. The Safe Harbor Provisions in BNSF's Coal Loading Rule Address The Board's Concerns With BNSF's Original Rule.

In providing guidance to BNSF on the development of a new coal dust mitigation rule, the Board explained that "[a] reasonable rule would provide certainty to the shippers . . . ." *Coal Dust I* at 12. The safe harbor provisions in BNSF's new Coal Loading Rule address the Board's concern by specifying straightforward and cost-effective measures that can be taken by shippers and their mine agents when they load coal that will put them into compliance with BNSF's loading requirement.

The safe harbor provisions of BNSF's Coal Loading Rule consist of two basic requirements: (1) shippers (or their mine agent) must groom loaded coal according to a specified load profile, and (2) shippers (or their mine agent) must apply to the loaded coal an approved topper agent. The safe harbor provisions also give shippers the option to use other coal dust reduction measures if the coal shipper can show that those measures will reduce coal losses by at least 85 percent. Each of these elements of the safe harbor provision is described in more detail below.

1. Load Profile Grooming

The first requirement of the safe harbor, set out in paragraph 3.A of the Coal Loading Rule, is that shippers must load coal in accordance with a specified aerodynamic load profile. In *Coal Dust I*, the Board acknowledged that PRB mines have already widely adopted the practice of grooming the profile of loaded coal in a rail car to an aerodynamic load profile. *Coal Dust I* at 12. The potential benefits from load profile grooming are obvious. By eliminating ridges and sharp corners, the aerodynamic grooming of loaded coal allows air to flow smoothly over the loaded coal and minimizes the disruption of the surface of the coal that can lead to coal dust losses in transit. As the Board explained, "[t]his profile is designed to reduce coal dust emission by reducing the effect of air currents on loaded coal." *Id.* at 12.

The grooming of loaded coal is achieved through the use of special loading chutes in the loading process. As explained in the verified statement of Messrs. Carré/Murphy, BNSF's consultants worked with the PRB mines over a period of several years in the late 2000s to develop appropriate loading chutes for each mine, and all PRB mines have now adopted redesigned chutes. BNSF's consultants have also worked extensively with the PRB mines to assist them in the proper use of the loading chutes to achieve an appropriate profile of the loaded coal. Messrs. Carré/Murphy explain that they have spent many hours in the field observing coal load profiles and providing feedback to the mines to improve the mines' loading technique.

2. Application of Approved Topper Agents

Even when the coal load is properly groomed, load profile grooming has only a modest impact on coal dust losses in transit. Therefore, in addition to the grooming of loaded coal, the safe harbor provisions require that coal shippers apply an approved topper chemical agent to the loaded coal. *See* Exhibit 1 ¶ 3.B of the Coal Loading Rule. The topper agent forms a pliable crust on top of the coal that prevents the wind from blowing the coal out of the moving car.

Application of a topper agent to the loaded coal is straightforward and does not require sophisticated equipment. Messrs. Carré/Murphy explain how topper agents are applied in the coal loading process. As explained by Messrs. Carré/Murphy, the topper agents approved for use under BNSF's safe harbor are non-toxic products that do not adversely affect utilities' boilers. Topper agents appropriate for use in controlling coal dust are also widely available. There is an established dust control industry which includes a number of vendors that produce chemical agents that can be applied to loaded coal in rail cars to reduce coal dust losses in transit. Mr. VanHook includes with his statement product brochures of several suppliers of dust control agents available for use on loaded coal.

Chemical agents are widely used today to control coal dust in a variety of coal operations. As Mr. Rahm explains, chemical topper agents are widely used at coal-fired electric generating facilities to control coal dust from stationary coal stockpiles at the utility plant. Several chemical agents are used to control coal dust within the utility plant. Mr. Rahm explains that the Environmental Protection Agency has specifically endorsed the use of chemicals to suppress coal dust in the operation of coal-fired electric generating facilities. Coal mines also apply chemical agents to coal in the mining and loading of coal to suppress coal dust. Some coal shippers have instructed their mine agents to apply certain "body-treatment" chemicals to the coal at the mines in an effort to reduce the coal dust that is created when the coal arrives at the shipper's facility for further processing.

As Messrs. Carré and Murphy explain, the effectiveness of topper agents in reducing coal dust losses in transit is beyond any serious dispute. There is abundant technical literature, reaching back to the 1970s, reporting on the effectiveness of topper agents in reducing coal dust blown from railcars in transit.[6] Indeed, in every coal producing region outside the PRB where coal dust has been deemed to be a problem, topper agents have been used to manage coal dust losses.

When the State of Virginia raised concerns about coal dust losses from moving rail cars, coal mines served by Norfolk Southern responded by applying topper agents to the loaded coal. The Virginia Senate expressly found in 1997 that profiling and spraying a chemical topper agent "have significantly reduced the amount of coal dust blown from moving trains." Senate Joint Report No. 257 (Feb. 13, 1997). Messrs. Carré and Murphy explain that Canadian environmental officials in the 1980s recommended that coal trains be sprayed with chemical topper agents to control coal dust in transit, and the major mining companies have complied with this recommendation for several years. Messrs. Carré and Murphy note that the Australian Department of Environment and Resource Management has approved the QR National Network's plan to require mines to apply topper agents to groomed coal loads. Several mines have begun applying toppers and all mines are expected to be in compliance by the end of 2013. Mr. Bobb noted in his testimony in *Coal Dust I* that toppers are also used in China, where officials concluded that the use of toppers would make more coal available for use in generating electricity by reducing the amount of coal lost in transit. *Coal Dust I*, Bobb Rebuttal VS at 2-3. Mines in Colombia are also applying topper agents.

Mr. VanHook and Messrs. Carré/Murphy explain that BNSF also carried out several tests from 2005 through 2011 that confirm the effectiveness of applying topper agents to groomed

[6] The articles referred to by Messrs. Carré and Murphy are included in full on the CD attached herein to BNSF's Opening Evidence and Argument. The CD also contains documents that have been excerpted in the exhibits, as well as videos referred to by Messrs. Carré and Murphy.

coal loads. Most of those tests involved the use of passive collectors mounted on the rear sill of several loaded cars in a train. Mr. VanHook describes the testing methodology in detail in his verified statement. The objective of these tests was to compare the amount of dust collected in the dust collectors attached to treated and untreated cars. In 2010, BNSF undertook a large-scale test of topper agents – the Super Trial – using this test approach. The testing protocol was thoroughly vetted with participating shippers and the data collected was shared with the participants and discussed in several open meetings. The topper agents tested in the Super Trial were shown to reduce coal dust losses by 73 percent to 93 percent. Three of the topper agents reduced coal dust losses by at least 85 percent, and those three toppers are approved for use in BNSF's safe harbor.[7] Subsequent tests showed that two additional topper agents could reduce coal dust losses by at least 85% and those toppers have also been added to the safe harbor list of approved toppers.

As explained by Mr. VanHook and Messrs. Carré and Murphy, BNSF also assisted PRB coal shippers in conducting their own tests of the effectiveness of topper agents in reducing coal dust. Those tests reached the same conclusions that BNSF had reached, namely that some chemical toppers were capable of reducing coal dust losses by over { }[8] Indeed, Messrs. Carré and Murphy explain that tests conducted by Dr. Viz, WCTL's witness in this proceeding, found {

}.

BNSF is not involved in commercial discussions with producers of the topper agents, so the information that BNSF has on the cost of the topper agents is incomplete. However, as Mr.

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[7] One of the approved toppers is available in concentrate and pre-mixed with water.

[8] Confidential materials are designated by a single bracket – "{" – and Highly Confidential materials are designated with double brackets – "{{."

VanHook explains, the information available to BNSF indicates that the available topper agents cost significantly less than the costs estimated by shippers in *Coal Dust I.* BNSF's information indicates that the approved topper agents cost from about {{ }} per ton. Shippers' cost estimates in *Coal Dust I* were as high as {{ }} per ton. The significant cost reductions that are already being seen in the market confirm BNSF's expectation that coal dust compliance costs will come down as shippers begin taking appropriate measures to deal with coal dust and the market for supplying topper agents continues to develop.

Counsel's Exhibit 4 contains correspondence obtained in discovery that shows the {{

}} Prices are expected to come down further as shippers begin implementing BNSF's Coal Loading Rule. *See id.* at 12 {{

}}

As Mr. VanHook explains, the cost to apply topper agents is a very small percentage of a coal shipper's total delivered cost of coal. Mr. VanHook estimates that for a typical coal shipper, the application of toppers will increase the delivered cost of coal by less than one half of one percent. Moreover, the costs incurred to apply the topper agent are at least partially offset by the cost savings that result from preserving the coal that would otherwise be lost in transit for use in the shippers' electric generating facilities.

3. Alternative Safe Harbor Methods

BNSF's Coal Loading Rule also has an alternative safe harbor provision that allows shippers to obtain safe harbor treatment for coal dust management approaches other than those specified in the rule. *See* Counsel's Exhibit 1, BNSF's Coal Loading Rule ¶ 4. A shipper may obtain safe harbor treatment for an alternative approach if the shipper shows that the approach is effective in reducing coal dust by at least 85 percent, the coal dust reduction benchmark in BNSF's Coal Loading Rule. This alternative reflects BNSF's belief that the market will evolve to supply innovative and less expensive approaches to coal dust management if coal shippers and their mine agents have the flexibility to explore alternatives. BNSF adopted this alternative to ensure that shippers will have access to the most cost-effective methods of reducing coal dust. If shippers can identify an effective approach to coal dust mitigation that is less costly than the approach BNSF has already identified in the safe harbor provision, BNSF wants to make sure that shippers are able to pursue such an approach.

Alternatives to the application of topper agents have already been tested. Several tests were carried out after the Super Trial of a compaction methodology in which the loaded coal was pressed into the rail car, forming a flat surface. Mr. VanHook describes the compaction test and explains that the approach did not produce reductions in coal dust. Other approaches are also being explored, including modified body treatments. The Coal Loading Rule makes it clear that BNSF will give safe harbor treatment to such approaches if they are shown to reduce coal dust losses by at least 85 percent.

C. The Concerns Raised By WCTL Do Not Justify A Finding That The Safe Harbor Provisions Are Unreasonable.

In the November 22, 2011 Decision initiating this proceeding, the Board stated that the proceeding "will allow parties to address issues raised by WCTL that are related to the reasonableness of the safe harbor provision, such as the absence of penalties for noncompliance, the lack of cost sharing, and shipper liability associated with the use of BNSF-approved topper agents." November 22, 2011 Decision at 4, note 5. WCTL raised concerns regarding each of these issues in its August 2011 request for a stay and mediation. BNSF explains below why WCTL's concerns on these issues are misplaced. WCTL also raised a number of science-related issues in its August 2011 request, which BNSF also addresses below.

1. The Absence of Penalties for Noncompliance.

WCTL argues that the safe harbor provisions in BNSF's Coal Loading Rule are unreasonable because the Rule "continues to leave coal shippers in the dark as to what penalties BNSF may apply to non-compliant shippers . . . ." *See* Petition to Reopen and for Injunctive Relief Pending Board Supervised Mediation, Docket No. FD 35305, at 8 (filed Aug. 11, 2011) ("Petition to Reopen"). According to WCTL, this is the same concern that the Board had in *Coal Dust I* with BNSF's prior coal dust, where the Board noted that BNSF "does not explain what consequences coal shippers would face if they are found to have tendered coal cars to the railroad that subsequently released coal dust during transport." *Id.* at 15 (quoting *Coal Dust I* at 14).

WCTL is incorrect. The safe harbor provisions of BNSF's Coal Dust Loading rule eliminate any legitimate concerns about the lack of an enforcement mechanism in its loading rules. The purpose of the safe harbor is to identify specific loading actions that can be taken to ensure that a shipper will be in compliance with BNSF's loading requirements and thereby avoid any enforcement action or penalties. The adoption of a safe harbor distinguishes BNSF's current rule from its prior rule precisely because the safe harbor eliminates the need to consider enforcement or compliance.

In *Coal Dust I*, the Board was concerned that a shipper would not know when it loads coal whether the shipper would be in compliance with BNSF's coal dust requirements. Compliance with BNSF's coal dust requirements would not be determined until after the trains left the mine and passed trackside monitors en route to the train's destination. The Board found that this uncertainty over whether a particular train would be found to be in compliance with BNSF's rule was compounded by the uncertainty over what consequences might ensue if the shipper were found not to be in compliance.

BNSF's adoption of a safe harbor provision in its loading rules eliminates the uncertainty over compliance that gave rise to the Board's concern. Under BNSF's new Coal Loading Rule, shippers now know exactly what needs to be done to comply with BNSF's Coal Loading Rule. If a shipper carries out the actions described in the safe harbor, the shipper will be in compliance with the Coal Loading Rule. Uncertainty over what penalties or enforcement measures might apply to non-compliant shippers should no longer be a concern because shippers will know exactly what needs to be done to comply with BNSF's Coal Loading Rule.

Since BNSF's loading rule now has a safe harbor that can readily be implemented, the only reason a shipper would still have an interest in knowing the consequences of non-compliance is if the shipper were thinking of choosing between compliance and non-compliance with the coal dust loading requirements, and they wanted to evaluate the relative costs of the two options. But non-compliance with reasonable loading requirements should not be an option that shippers can choose. As explained by BNSF's Group Vice President, Coal Marketing, Mr. Bobb, it would not be appropriate for shippers to choose between compliance and non-compliance with valid loading requirements based on the shipper's assessment of the relative costs of compliance and non-compliance. BNSF cannot run a safe and efficient railroad if shippers are given the choice of whether to comply with loading requirements or defy the rules and simply pay penalties for non-compliance. It is understood by BNSF's shippers that BNSF's loading and operating rules define the terms on which BNSF has agreed to handle the traffic. Uniform adherence to the rules is understood by BNSF and its shippers to be an essential part of running a safe, efficient railroad.

WCTL claims that even if a shipper intends to comply with BNSF's loading rule, the shipper needs to know what penalties will be assessed in the event the shipper tries to comply but does not successfully implement the safe harbor requirements, for example by "improperly apply[ing] an approved topper." Petition to Reopen at 15. Mr. Bobb explains that as of now, there are no penalties for a shipper that agrees to comply with the safe harbor provisions of the Coal Loading Rule and takes good faith measures to carry out the safe harbor actions. BNSF recognizes that shippers and their mine agents may require some time to gain experience with the proper grooming of loaded cars and the application of toppers. During this period, BNSF has not established penalties for shippers and mines that try to comply but fail to achieve optimal results. BNSF may determine in the future that penalties and incentives are necessary to improve compliance efforts, but for now BNSF requires only that the shippers and their mine agents try in good faith to comply with BNSF's loading requirements.

BNSF hopes and expects that broad compliance with its loading requirements will come about when this proceeding has concluded without the need for enforcement measures. As Mr. Bobb explains, most of BNSF's coal shippers understand the need to implement coal dust mitigation and accept their responsibility to take appropriate measures. However, while this proceeding is pending and a group of shippers is challenging BNSF's ability to require shippers to implement responsible loading practices, there is little incentive for individual shippers to commit to a program of coal dust mitigation. Once the uncertainty created by the pendency of this proceeding is removed by a Board decision, BNSF is confident that these shippers will fully comply with BNSF's loading requirements.

If enforcement of BNSF's loading rules against BNSF's contract shippers nevertheless becomes necessary, BNSF can pursue contract remedies. The Board does not need to and has no authority to get involved in the enforcement of contract commitments regarding coal dust mitigation. As to BNSF's common carriers, BNSF also does not believe that its common carrier shippers will defy loading rules that the Board finds are reasonable. But if there are common carrier shippers that still refuse to comply, BNSF will determine what actions are appropriate at that time and BNSF will provide at least 60 days' notice to enable the affected shipper to seek Board intervention if it chooses to do so. There is no need in this proceeding to address future issues that may never arise.

2. Cost Sharing

WCTL also argues that the safe harbor provisions of BNSF's Coal Loading Rule are unreasonable because the Rule does not provide for a sharing between BNSF and its shippers of the costs to comply with the safe harbor provisions. The sharing of costs is a commercial issue that does not belong in this proceeding.

As Mr. Bobb explains in his verified statement, most of BNSF's coal transportation is provided under confidential transportation contracts that define the parties' respective obligations to pay for service and to perform various activities related to coal transportation. How railroads and shippers allocate costs among themselves is a question that is addressed in the commercial negotiations leading to the contract. Each contract represents a separately negotiated bargain, with terms that vary from one agreement to another. The Board does not have jurisdiction over the terms of those contracts, and the Board should not interfere with the contract relationships by making broad statements as to how costs related to transportation should be allocated.

Mr. Bobb explains that {{

}} By asking the Board to mandate cost sharing, WCTL is trying to get the Board to do what {{ }}

Therefore, the Board should not issue any broad statement as to the proper allocation of costs between BNSF and its shippers given the potential to interfere with commercial arrangements that have already been negotiated between BNSF and its contract shippers. As to BNSF's common carrier shippers, where the Board does have jurisdiction in certain cases over the commercial relationship between the railroad and the shipper, it would make no sense to mandate a cost-sharing arrangement. As noted by Mr. Bobb, the cost of loading freight has traditionally been borne by the shipper, since the shipper or its agent is responsible for and controls the loading process. BNSF should not have to bear the costs of loading activities conducted by other parties over whom BNSF has no control.

Moreover, as Mr. Bobb notes, the Board does not generally get into the issue of cost sharing as it relates to operating or loading rules. If the Board were to make an exception here, it could open the door to many new disputes over operating and loading rules in areas where there has never been a concern in the past. The Board should not get into the issue of cost sharing in this proceeding.

3. Shipper Liability For Loading Practices

BNSF's Coal Loading Rule provides that "[a]ny product including topper agents, devices or appurtenance utilized by the Shipper or Shipper's mine agents to control the release of coal dust shall not adversely impact railroad employees, property, locomotives or owned cars." *See* Exhibit 1, BNSF's Coal Loading Rule ¶ 4. WCTL argues that "[i]t is fundamentally unfair for BNSF to mandate train spraying, and then turn around and say that shippers are responsible if this spraying adversely impacts BNSF's employees or property." Petition to Reopen at 21-22.

It is not unreasonable for shippers to take responsibility for the consequences of their loading practices. The Board acknowledged in *Coal Dust I* that it was reasonable for BNSF to require its shippers to control coal dust through responsible loading practices that would keep the loaded coal in the railcars during transit. Since shippers and their mine agents control the loading process, they should be responsible for any adverse consequences of their loading practices.

The fact that BNSF has established a safe harbor involving the application of toppers should not change the shippers' responsibility for loading coal in a safe manner that will not cause injury to BNSF's employees or property. The shippers are traditionally responsible for keeping their freight in the railcars and for loading their freight to ensure its safe transportation. The safe harbor simply identifies actions that BNSF will deem appropriate to comply with the shippers' obligation to load freight so that it stays in the railcars.

In addition, Mr. Bobb explains that WCTL appears to have misunderstood BNSF's intent in including the liability provision in its Coal Loading Rule. BNSF's intent was not to hold shippers responsible for injury or damages associated with the proper use of topper agents. As explained by Mr. VanHook, BNSF tested the toppers before approving their use to make sure that they were not dangerous or injurious to railcars if properly used. BNSF's intent was to hold shippers responsible for negligent or improper use of the toppers, not for the proper use of a topper. BNSF also included the liability provision in the Rule to make it clear that if shippers propose alternative coal dust mitigation approaches, the shipper will need to show that such approaches will not impose a hazard to BNSF's employees and property. That is a valid objective.

4. The Science Underlying BNSF's Selection of Approved Toppers

In its August 2011 request for a stay and mediation, WCTL indicated that it intends to raise questions about the science underlying BNSF's choice of approved topper agents. Specifically, WCTL made the following allegations regarding science issues: (1) BNSF relied on the same "closed door approach" in developing its safe harbor provision that it relied upon in developing its IDV standards, and "WCTL and other coal shippers, have not had access to any dust sample data or statistical analyses that BNSF used in its Super Trial." Petition to Reopen at 17-18. (2) The development of the safe harbor standard "is fatally flawed" because the monitoring of 1,518 trains "must be thrown out for the same reasons the STB rejected the

Original Coal Dust Tariff," and the passive collector study results "do not provide a reasonable measure of actual coal dust emissions from any train." *Id.* at 18-19.

As shown below, both of these lines of attack are unfounded. Of greater importance here, the Board should not allow a straightforward inquiry into the reasonableness of the safe harbor provisions of BNSF's Coal Loading Rule to become mired down in a manufactured-for-litigation controversy about science. In *Coal Dust I*, the Board did have concerns about the technology involved in BNSF's use of trackside monitors to determine shippers' compliance with the dust suppression standards set out in the challenged rule. But despite WCTL's efforts to inject them into a dispute over the current rule, the trackside monitors should not be an issue in this case. They are not used to determine shipper compliance with the safe harbor provision.

As to WCTL's first line of attack – the "closed door"/no data allegation – WCTL is simply wrong. The overall methodology and specific technology that BNSF employed in developing its safe harbor provisions were well known to and well understood by interested coal shippers and their mine agents. Both the rationale for coal load grooming and the rationale for applying topper agents to loaded coal cars have entered the public domain over the past several years as a result of BNSF's investigation of coal dust suppression and its sharing of the results of those investigations. The current proceeding is a far cry from a case where a challenged rule is premised on exotic "science" that is shielded from public view.

The claim that coal shippers "have not had access to any dust sample data or statistical analyses that BNSF used in its Super Trial" is also wrong. All PRB coal shippers were free to participate in the Super Trial, and all coal shippers who participated received data reflecting the testing conducted in the Super Trial. BNSF has not closed shippers out of the process of testing used to select the topper agents that qualify for use under the safe harbor provision.

WCTL's second line of attack is also unavailing. It is true the BNSF used trackside monitors to compare dusting from treated versus untreated trains. But the technology that BNSF relied upon in identifying which topper agents met the 85 percent dust reduction threshold was the more straightforward use of passive dust collectors. The fact that the results yielded by the trackside monitors corroborated the results yielded by the passive dust collectors was reassuring to BNSF, but the Board need not rely on those results to find BNSF's safe harbor provisions reasonable.

Dr. Viz's criticisms of BNSF's passive dust collector tests were thoroughly addressed in a verified statement by Dr. G. David Emmitt, President and Senior Scientist of Simpson Weather Associates, that was attached to BNSF's August 23, 2011 Reply to WCTL's request for a stay and mediation. Dr. Emmitt explained that "[]most of the questions raised by Dr. Viz are irrelevant because they involve the difficulty in predicting the specific quantity of coal dust that could be expected to be blown off a particular train, as opposed to the relative amount of coal dust blown out of treated and untreated cars on the same train." BNSF's Reply to WCTL's Petition to Reopen, Emmitt VS at 3 (filed Aug. 23, 2011). Regarding Dr. Viz's assertion that the sample size used in BNSF's passive collector coal dust tests in the Super Trial was not large enough to be statistically significant, Dr. Emmitt stated, "I disagree." *Id.* at 4. Dr. Emmitt pointed out that while only 115 trains were tested in the passive collector test, it was possible to make a valid statistical inference from the Super Trial passive collector test, "where the relative impact of the topper agent is based on results from several treated cars and several untreated cars on the same train and thus experiencing the same weather and the same trip stresses." *Id.*

Moreover, as Dr. Emmitt noted, it is important to view Dr. Viz's criticisms in the context of BNSF's safe harbor provision, which is the provision under challenge here. BNSF had a clear incentive to follow a testing procedure that would yield accurate information regarding the effectiveness of topper agents so that coal dust losses from loaded railcars would be effectively controlled. It believes that it successfully identified topper agents that meet its 85 percent dust reduction threshold, and the shippers who participated in the Super Trial did not disagree. If some shippers believe that BNSF's testing did not result in the selection of the most effective topper agents, those shippers have the alternative of identifying more effective topper agents and getting them approved for use under the alternative safe harbor provision of BNSF's Coal Loading Rule.

IV. CONCLUSION

After years of study and extensive work with PRB coal shippers and their mine agents, conditions are now in place to deal with the serious problem of coal dust in the PRB. All PRB mines have installed loading chutes that will allow the grooming of coal to an aerodynamic load profile. Most of the PRB mines, and all of the major mines, have equipment that can apply topper agents to loaded cars. Several mines are already applying toppers for some of their customers. Most of BNSF's shippers have accepted their responsibility to deal with coal dust through loading practices that will ensure that their coal remains in the loaded car during transit. Mr. Bobb explained that {{

}} The mines are just waiting for word from their customers to undertake the loading practices described in BNSF's safe harbor. *See* Counsel's Exhibit 5, which contains correspondence on this issue obtained by BNSF in discovery. Once that happens, coal dust will no longer pose a serious threat to the safety and efficiency of PRB coal transportation.

While most of BNSF's shippers are ready to comply with BNSF's loading requirements, BNSF has seen increasing reluctance by shippers while this proceeding is pending to undertake the necessary measures to deal with coal dust. There is little incentive for shippers – even shippers that agree that something must be done – to commit to a regime of coal dust mitigation when some shippers are refusing to go along and are seeking the Board's blessing to defy BNSF's loading rules. BNSF believes that WCTL is using the regulatory process to put off for as long as possible incurring the costs of dealing with coal dust. This is a short-sighted strategy on their part, given the importance of efficient PRB transportation to the energy supply chain in the United States. But it is also holding up progress that BNSF has been able to make with other shippers that are otherwise ready and willing to take the necessary steps to deal with coal dust.

The Board should act promptly in this proceeding. Once BNSF's coal loading rule has been found to be reasonable, BNSF is confident that there will be prompt and widespread compliance with the loading requirements. This will not cause any hardship or interference with current operations. But it will begin to bring coal dust under control and ensure the continued safe and efficient operation of the vital PRB coal transportation infrastructure.

Respectfully submitted,

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October 1, 2012

CERTIFICATE OF SERVICE

I hereby certify that on this 1st day of October 2012, I caused a copy of the foregoing to be served by hand delivery upon all parties of record in this case as follows:

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COUNSEL'S EXHIBITS

EXHIBIT 1

BNSF PRICE LIST 6041-B
(Cancels BNSF Freight Tariff 6041-A)

PROVIDING

RULES AND REGULATIONS GOVERNING UNIT TRAIN AND VOLUME ALL-RAIL

COAL SERVICE, ALSO ACCESSORIAL SERVICES AND CHARGES THEREFOR

APPLYING AS PROVIDED IN PRICE LIST

ISSUED: September 19, 2011 EFFECTIVE: October 9, 2011
Issued by BNSF Price Management, P.O. Box 961069, Ft. Worth, TX 76161-0069

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ITEM 100
COAL DUST MITIGATION REQUIREMENTS

1. To prevent contamination of the rail ballast caused by fugitive coal dust, BNSF is modifying the loading requirement applicable to all coal cars loaded at Montana and Wyoming mines by shippers whose coal transportation is subject to this Rules Book.

2. Effective October 1, 2011, shippers loading coal at any Montana and Wyoming mine must take measures to load coal in such a way that any loss in transit of coal dust from the shipper's loaded coal cars will be reduced by at least 85 percent as compared to loss in transit of coal dust from coal cars where no remedial measures have been taken. At least 30 days prior to loading cars for shipment by BNSF, a Shipper shall provide BNSF with written notice of compliance efforts.

3. A shipper will be deemed to be in compliance with the loading requirement set out in this Item if the shipper satisfies Sections 3.A and 3.B below or pursues the option in Section 4 below:

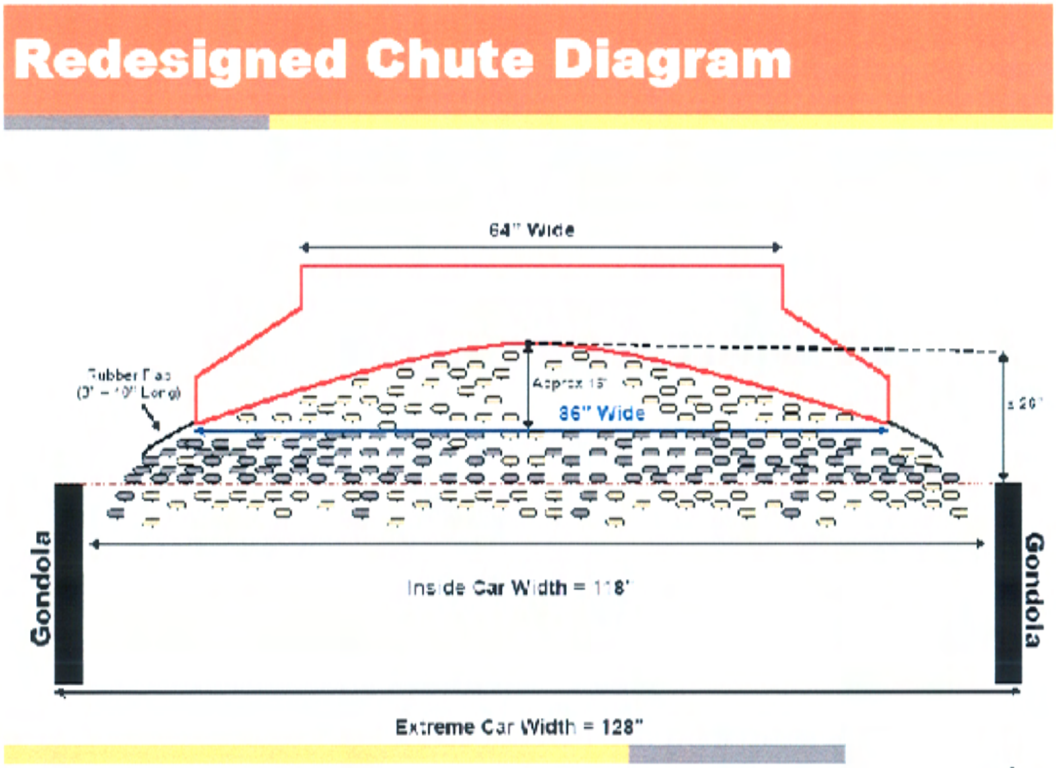
A. Shipper ensures that loaded uncovered coal cars will be profiled in accordance with BNSF's published template entitled "Redesigned Chute Diagram" located in Appendix A to this publication.

B. Shipper ensures that an acceptable topper agent (e.g., surfactant) will be properly applied to the entire surface of all loaded coal cars at an effective concentration level and in accordance with the manufacturer's specifications. An acceptable topper agent is one that has been shown to reduce coal dust loss in transit by 85%. Appendix B to this publication lists the topper agents that meet this criteria. Proper use of any one of the topper agents on the approved list in accordance with the manufacturer's specifications and at the application rates specified in Appendix B, will satisfy this safe harbor provision. BNSF will consider other topper agents to be acceptable for purposes of this safe harbor provision if the shipper can demonstrate that appropriate testing has shown that the topper agent achieves compliance with this Item. Guidelines for the testing of new topper agents will be provided upon request.

4. Shipper may seek inclusion of any other method of coal dust suppression (*e.g.*, compaction or other technology) in the safe harbor provision of Section 3.B above by submitting a compliance plan to BNSF that provides evidence demonstrating that an additional proposed compliance measure will result in compliance with this Item. Shipper must also satisfy the profiling requirement of Section 3.A above. Any product including topper agents, devices or appurtenance utilized by the Shipper or Shipper's mine agents to control the release of coal dust shall not adversely impact railroad employees, property, locomotives or owned cars.

APPENDIX A

REDESIGNED CHUTE DIAGRAM



APPENDIX B

Acceptable Topper Agents and Application Rates

Topper Agents [(1)]	Concentration Rate per Car [(2)]	Total Solution Applied per Railcar [(3)]
Nalco Dustbind Plus	2.0 gal	20 gal
Midwest Soil-Sement	1.25 gal	18.75 gal
AKJ CTS-100	1.36 gal[(4)]	15 gal
AKJ CTS-100C	1.36 gal[(4)]	15 gal
Rantec Capture 3000	2.5 lbs	20 gal
MinTech Min Topper S+0150	1.1 gal	20 gal

(1) For Topper Application only.
(2) The amount of topper agent mixed into a solution for each Railcar. These concentration rates were established during testing. c
(3) The amount of topper agent applied to each Railcar.
(4) 1.36 gallons of concentrate (CTS-100C) mixed with 13.64 gallons of water.

EXHIBIT 2

EXHIBIT 2
IS CONFIDENTIAL

EXHIBIT 3

EXHIBIT 3
IS HIGHLY CONFIDENTIAL

EXHIBIT 4

EXHIBIT 4
IS HIGHLY CONFIDENTIAL

EXHIBIT 5

EXHIBIT 5
IS HIGHLY CONFIDENTIAL

VERIFIED STATEMENT OF
STEVAN B. BOBB

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35557

REASONABLENESS OF BNSF RAILWAY COMPANY
COAL DUST MITIGATION TARIFF PROVISIONS

VERIFIED STATEMENT OF STEVAN B. BOBB

My name is Stevan B. Bobb. I am Group Vice President, Coal Marketing for BNSF Railway Company ("BNSF"), a position I have had since 2006. In this position, I have responsibility for the sale and marketing of BNSF's coal transportation services, which is one of BNSF's four principal lines of business. Since 2006, I have been responsible for supervising BNSF's extensive and on-going study of coal dust in the Powder River Basin ("PRB") and approaches to deal with the coal dust problem. I submitted testimony in the prior coal dust proceeding – *Arkansas Electric Cooperative Corporation – Petition for Declaratory Order*, Finance Docket 35305 ("*Coal Dust I*") – regarding BNSF's efforts in this area and BNSF's work with its shippers on coal dust issues. I was responsible for developing BNSF's Coal Loading Rule for dealing with coal dust – Item 100 of BNSF's Price List 6041-B ("Coal Loading Rule" or "Rule") – and the safe harbor provisions in that Rule that are the subject of this proceeding.

The purpose of my verified statement is to explain to the Board that BNSF developed the safe harbor provisions of BNSF's Coal Loading Rule to address the Board's concern in *Coal Dust I* that shippers need to be certain when they load coal that they will be in compliance with BNSF's coal dust mitigation requirements. The safe harbor provisions in the Rule follow the Board's guidance in *Coal Dust I* by giving shippers a straightforward and cost-effective way of reducing coal dust losses from loaded cars.

I also explain that BNSF has worked extensively with its shippers to develop a consensus that coal dust must be addressed through appropriate loading practices. Most of BNSF's shippers are ready to implement BNSF's loading requirements and some of BNSF's shippers have begun to comply with BNSF's Coal Loading Rule. However, many of our shippers are reluctant to do anything while this proceeding is pending and while some of their competitors are openly refusing to take any coal dust mitigation measures. Indeed, I am concerned that the main objective of the handful of coal shippers challenging BNSF's rule is to use this proceeding to put off for as long as possible their obligation to deal with coal dust. Their litigation strategy is holding up any significant progress in getting coal dust under control in the PRB.

The Board understands the serious risks to the safety and efficiency of the coal supply chain posed by continued coal dust losses along PRB rail lines. It is important to avoid any further delays in getting coal dust under control in the PRB. The Board should act promptly in this proceeding and make it clear that shippers must comply with BNSF's Coal Loading Rule.

I. BNSF Developed The Safe Harbor Provision In Its Current Loading Rule to Comply With The Board's Ruling In *Coal Dust I*.

The safe harbor provisions in BNSF's Coal Loading Rule reflect BNSF's best effort to comply with the guidance offered by the Board in *Coal Dust I* as to what would be required to come up with a reasonable loading rule to deal with coal dust. The Board agreed with BNSF that coal shippers, like any other shipper, must take reasonable loading measures to ensure that their freight remains in the railcar during transit. The Board's concern with BNSF's prior coal dust rule was that coal shippers should have certainty when they load the coal cars that they will be in compliance with BNSF's loading requirements if in fact they make a good faith effort to comply. We have responded to that concern by establishing a safe harbor in our Coal Loading Rule that sets out straightforward actions that our shippers and their mine agents can take when loading coal to ensure that they will be in compliance with BNSF's loading rules.

BNSF's safe harbor approach provides a cost-effective way of preventing most coal dust from escaping from rail cars. We know from our own tests in the PRB and the extensive experience of others in coal producing regions outside the PRB that the use of topper chemicals along with coal load profile grooming can substantially reduce coal dust losses in transit. As far as we know, this two-pronged approach to coal dust mitigation is the only approach available today that is commercially feasible. Everywhere in the world that measures have been taken to address coal dust in transit, topper agents have been applied to loaded coal, usually along with some form of load profile grooming.

Grooming the loaded coal to an aerodynamic profile reduces the disruptive effect of wind on the coal as the train moves. However, grooming alone reduces coal dust by only a modest amount. When toppers are applied to the groomed coal, coal dust losses can be substantially reduced. The topper agents are specially formulated chemicals that form a pliable crust on top of the coal that prevents the coal dust from being blown out of the cars in transit. Chemical agents have been used for many years by utilities to control coal dust at their electricity generating facilities to prevent wind from blowing coal dust off of coal stockpiles. While coal stockpiles are stationary, the coal dust problem at electricity generating facilities results from the effect of wind on the coal, which is the same basic cause of coal dust losses in transit.

Under the safe harbor provisions in BNSF's Coal Loading Rule, shippers will be deemed in compliance with BNSF's coal loading requirements so long as they or their mine agents load coal in accordance with the coal load profile set out in the Rule and apply one of several approved topper agents to the loaded coal. As described in detail by BNSF's witness Mr.

VanHook, BNSF, with cooperation from several coal shippers, conducted extensive field tests in 2010, referred to as the Super Trial, to identify the most effective topper agents commercially available for coal dust control. In the Super Trial and subsequent tests we identified five topper agents (including one topper that can be applied in concentrate and pre-mixed with water) that reduce coal dust losses in transit by at least 85%. The five toppers identified in the Super Trial and subsequent tests have been incorporated into BNSF's safe harbor rule and are set out in Appendix B to the Rule. We expect that more tests will be done and additional toppers will be added to the safe harbor list in the future.

The Super Trial made it clear that it is possible to achieve a meaningful reduction of coal dust through straightforward steps. All PRB mines have modified their coal loading chutes to be able to meet the load profile set out in the safe harbor rule, and they have begun to acquire experience in using those modified chutes to achieve aerodynamic load profiles. Most PRB mines, including all of the major mines, have facilities for the application of toppers. They are just waiting for their coal purchasers to instruct them to begin spraying.

The costs of complying with the safe harbor are modest. As explained by Mr. VanHook, compliance with the safe harbor will add only a negligible amount to the delivered cost of coal. We expect that costs will come down further as more shippers begin to comply with BNSF's Coal Loading Rule. We also expect that the shippers' compliance costs will be offset to a significant extent by preventing the loss of coal in transit, thereby ensuring that shippers will have more coal to burn at their plants.

The reasonableness of asking shippers to incur the modest cost of controlling coal dust in transit through proper loading practices and use of topper agents can be seen by reference to shippers' approach to coal dust at their plants. Coal shippers already take extensive measures to deal with coal dust at their electricity generating facilities, including, as noted above, the use of chemical dust suppressants. Their mine agents also take extensive measures to control coal dust in the mining process. There is no reason that coal shippers should avoid responsibility for coal dust in the movement of their coal from the mines to their power plants. There are reasonable ways to load coal to avoid coal dust losses in transit, and shippers should begin to take the necessary steps to manage coal dust in the only part of the process of mining, handling and burning coal where such measures are not already being taken.

Our Coal Loading Rule has an additional positive feature in that it gives shippers the option to use alternative coal dust mitigation approaches if the shipper believes those approaches to be less costly, so long as the shipper can demonstrate the effectiveness of the alternative approach. The purpose of this alternative compliance approach is to offer shippers the incentive to seek out and adopt more cost effective methods of coal dust mitigation that could advance their interest in minimizing their costs of compliance while meeting BNSF's goal of keeping coal in the loaded cars.

II. Most Of BNSF's Coal Shippers Accept Their Responsibility To Deal With Coal Dust, But Others Are Reluctant To Do Anything While This Proceeding Is Pending.

As I explained in my testimony in *Coal Dust I*, BNSF worked extensively with its shippers, the National Coal Transportation Association ("NCTA"), and PRB mines after the derailments in the spring of 2005 to understand the nature and extent of the coal dust problem in the PRB and to identify ways to address coal dust. I will not repeat that testimony here. Claims that BNSF has acted unilaterally are simply not true. I personally met several times with coal shippers at shipper association meetings to explain BNSF's efforts and to describe what we were finding. I met on numerous occasions with individual shippers to discuss the problem of coal dust and ways to address the problem.

As I noted above, in 2010 we conducted, at our shippers' request, a large-scale field test of chemical agents, the Super Trial, to identify the most effective toppers. Several coal shippers and PRB mines were direct participants in those tests. Mr. VanHook describes in detail the role that coal shippers played in the Super Trial. There were numerous informational meetings with the shipper participants and exchanges of information between BNSF and the participating shippers on the conduct of the field tests. BNSF spent substantial time and resources to conduct the Super Trial expressly for the purpose of providing our coal shippers with information that they could use to adopt appropriate coal dust suppression measures.

BNSF also sought input from its shippers on the specific language in the Coal Loading Rule. BNSF sought comments on a draft of the Rule from at least 15 PRB mines and coal shippers. I spoke with many of these mines and shippers about the provisions in the proposed Rule and its rationale. Several of these mines and shippers expressed their appreciation for BNSF's efforts to include them in the process of developing appropriate rules.

BNSF continues to work directly with its shippers and their mine agents to help them implement their coal dust mitigation efforts. BNSF has continued to send its consultants regularly to the PRB to monitor coal dust mitigation activities and to provide feedback to the shippers and their mines about their coal dust remediation efforts. BNSF is making substantial expenditures to establish a sophisticated laser-based monitoring station that can provide real-time data to mines on the effectiveness of their loading and topper application practices. The new system will allow us to provide mines and shippers with comprehensive data about all of the trains they are loading. Several shippers and mines have also asked us to continue providing them with coal dust data from the trackside monitors. We have gotten very positive reactions from mines that see this cooperation with BNSF as leading to a significant improvement in their coal dust remediation efforts.

BNSF's efforts have created a broad consensus among our shippers that the problem of coal dust must be addressed, and our shippers understand that the key will be to modify loading practices, including the application of topper agents during the loading process. Most of our shippers understand that it is in their own interests to deal with this problem. Indeed, {{

}}[1] Broad compliance with BNSF's loading requirements is ready to be implemented. When BNSF inquired about our coal shippers' plans to implement BNSF's Coal Loading Rule in October 2011, we received {{

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The only thing preventing widespread implementation of coal dust mitigation by our coal shippers is this proceeding. Since the fall of 2011, we have seen increasing reluctance by shippers to take affirmative steps to apply topper agents, even though many mines have put the appropriate infrastructure in place. While most of our shippers understand why a program of serious and focused coal dust mitigation is necessary, there is little incentive for individual shippers to commit to a regime of compliance while some of their competitors are hoping to delay incurring the costs of compliance for as long as possible and while the pendency of this proceeding before the Board allows them to argue that as yet they have no obligation to comply.

[1] Highly Confidential materials are designated with double brackets – "{{."

An individual shipper that takes responsible loading measures does not want to face criticism from its board or its regulators who can see that some competitors are openly defying BNSF's requirements. WCTL does not speak for all coal shippers. But while WCTL's members challenge BNSF's loading rule and refuse to comply with it, our other shippers may not be able to justify to their shareholders or regulators the expenditures necessary to implement responsible loading practices.

The regulatory uncertainty created by the pendency of this proceeding has therefore made it difficult to make additional progress in our efforts to bring coal dust in the PRB under control. {{

}} But several other shippers are reluctant to move forward while this proceeding is pending. Given the significance of the coal dust problem and the potentially serious impact of coal dust on the coal supply chain, it is important to avoid any further delays in implementing coal dust remediation measures. I ask that the Board act promptly and determine that our safe harbor coal loading rule is reasonable, so that all BNSF coal shippers will come into compliance with the rule as soon as possible.

III. WCTL's And AECC's Professed Concerns About The Safe Harbor Provisions In The Coal Loading Rule Are Unfounded.

When the Board initiated this proceeding, it indicated that it would look at certain concerns that WCTL and AECC have raised about the safe harbor provisions in the Coal Loading Rule. We have considered those concerns and do not believe that they provide a basis for the Board to find the safe harbor provisions in the Coal Loading Rule to be unreasonable.

Enforcement Provisions

WCTL has complained that the Coal Loading Rule does not have any enforcement provisions. I do not understand this concern. This proceeding is about the reasonableness of the safe harbor provisions in BNSF's Coal Loading Rule. There is no reason to include enforcement provisions in a rule that provides a safe harbor. The nature of a safe harbor is to take enforcement out of play by identifying actions that avoid disputes over whether a shipper has taken adequate steps to reduce coal dust losses. If a shipper takes the safe harbor actions or instructs its mine agents to do so, the shipper will be deemed in compliance with BNSF's Loading Rule and there is no need to consider enforcement.

I understand the concern expressed by the Board in *Coal Dust I* that BNSF's *prior* coal dust rule did not have any enforcement provisions. The Board's concern there stemmed from the fact that BNSF's prior rule did not have a safe harbor. The Board's concern with BNSF's prior rule was that a coal shipper would be uncertain when it loaded coal as to whether it would be deemed in compliance with BNSF's prior rules, since compliance with that rule would not be determined until the train left the mine and passed by the trackside monitors along the rail line. This uncertainty with compliance was then compounded by the uncertainty over the consequences of non-compliance. But BNSF's new safe harbor provisions eliminate that uncertainty. With the safe harbor, our coal shippers know exactly what needs to be done to be in compliance with BNSF's loading requirements. So long as a shipper or its mine agent takes steps to implement the safe harbor requirements, the shipper will be deemed in compliance with the Coal Loading Rule and the need to enforce the rule will not be an issue.

I am concerned that WCTL is insisting on knowing the consequences of non-compliance so that its members could choose between complying with BNSF's loading requirements or paying penalties as the price for opting out of compliance. Allowing shippers the option of complying with the loading rule is totally inappropriate. When BNSF establishes a loading rule or another type of operating rule, we expect all those who do business with us – shippers, people on our property, mines, our own employees – to comply with the rule. We cannot properly run our railroad if individual parties have the option to choose between complying with loading and operating rules or ignoring those rules based on their own assessment of the relative costs of compliance and non-compliance. Our loading and operating rules define the terms on which BNSF will handle a shipper's traffic, and uniform adherence to the rules is understood by BNSF and our shippers alike to be part and parcel of running a safe, efficient railroad. The Board should make it clear that BNSF has no obligation to offer shippers the choice of non-compliance.

As I explained above, most of our coal shippers understand that they must change their loading practices to deal with coal dust. {{

}} Broad compliance with BNSF's coal dust mitigation requirements is being held up only by the pendency of this proceeding. When the Board removes the regulatory uncertainty that is created by this proceeding, I am confident there will be broad implementation of the safe harbor without any need for enforcement actions.

As to our contract shippers, BNSF can address any non-compliance if it occurs with contract remedies. The Board does not need to get involved in those disputes nor does it have the authority to do so. As to the handful of common carrier coal shippers whose movements are subject to Board jurisdiction, we also anticipate compliance with the coal loading rule. We also continue to adhere to our prior representations that BNSF would adopt enforcement mechanisms if and when it became necessary to do so, which BNSF hopes will not be the case. BNSF would provide a time period of 60 days for such mechanisms to go into effect to allow shippers to challenge them.

WCTL also raises a question about how BNSF intends to respond if a shipper tries to comply with BNSF's Coal Loading Rule but does not successfully implement the specific safe harbor requirements, for example by failing to meet the specific load profile that is required or by improperly applying an approved topper agent. I have made it clear in my discussions with BNSF's shippers that BNSF will deem shippers to be in compliance with the safe harbor provisions so long as they or their mine agents take good faith measures to implement those provisions.

We understand that shippers and their mine agents will need time and experience to perfect their loading practices to deal with coal dust. Mine load-out operators need to develop expertise in load profile grooming and in the operation of the topper application equipment. As described by BNSF's witnesses Messrs. Carré and Murphy, we are currently implementing a laser-based system that provides detailed feedback to mines and shippers that will help the mines improve their loading practices. At some point in the future, BNSF may adopt measures that provide specific incentives for mines to improve their loading practices. But for now, BNSF requires only that the shippers and their mines try in good faith to comply with the Coal Loading Rules.

Cost Sharing

WCTL has also complained that the safe harbor provisions do not involve any sharing between BNSF and its shippers of the costs of complying with BNSF's Coal Loading Rule. The issue of cost sharing should not be relevant in this proceeding, which is focused on the reasonableness of BNSF's safe harbor provisions. The issue of cost sharing is a commercial issue, not an issue relating to the reasonableness of the loading practices that are set out in BNSF's safe harbor provisions.

Since it is a commercial issue, cost sharing is addressed through commercial discussions between BNSF and its shippers, most of which involve confidential coal transportation contracts that are outside the scope of the Board's authority. As I noted before, {{

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The Board should not get into the question of cost sharing at all in this proceeding. The vast majority of BNSF's coal transportation service is provided under confidential coal transportation contracts. These contracts define the parties' respective obligations to provide and pay for service and to perform various activities related to coal transportation. Each contract represents a separately negotiated bargain, with negotiated trade-offs varying considerably from one agreement to another. Any broad pronouncement as to cost sharing could have unintended consequences for BNSF and its contract shippers. The Board should leave it to BNSF and its contract shippers to address in the context of private, individual negotiations how the cost of coal dust mitigation will be addressed. Commercial practices such as cost sharing should not be established through broad public pronouncements.

Unlike contract movements, the Board has authority to consider the commercial arrangements between BNSF and its common carrier shippers in cases where BNSF has market dominance. But as to common carrier shippers, the costs associated with loading freight are normally borne by shippers, and they should be. Loading is performed by the shipper or its agent, so it is logical that the shipper bears those costs, not the railroad. BNSF takes control of loaded trains after they have been loaded on the mines' property. BNSF should not have to bear the costs of loading activities conducted by other parties over whom BNSF has no control.

Moreover, the Board does not generally get into the issue of cost sharing as it relates to operating or loading rules. If the Board were to make an exception here, it could open the door to many new disputes over operating and loading rules in areas where there has never been a concern in the past. The Board should not get into the issue of cost sharing in this proceeding.

Liability Provisions

Finally, the shippers have complained about the liability provision in the Coal Loading Rule, which provides that the shipper will be responsible for any injury to BNSF's personnel or property resulting from the shipper's coal dust mitigation practices. I was surprised by the reaction to this liability provision. I believe that shippers may have misunderstood BNSF's intent.

Our intent has not been to hold shippers liable for injury or damages associated with the *proper* use of the chemical topper agents. Our tests have shown that these substances are not dangerous or damaging when used properly. Our intent was to hold shippers liable for negligent or improper use of these toppers. We also wanted to make it clear that if shippers propose an alternative dust mitigation approach, the shipper will need to show BNSF that the approach is not dangerous to BNSF's employees or its property. These are legitimate objectives.

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 September 28, 2012

Stevan B. Bobb

VERIFIED STATEMENT OF
WILLIAM VANHOOK

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35557

REASONABLENESS OF BNSF RAILWAY COMPANY COAL DUST MITIGATION TARIFF PROVISIONS

VERIFIED STATEMENT OF WILLIAM VANHOOK

My name is William VanHook. I am recently retired from BNSF Railway Company ("BNSF") as Assistant Vice President and Chief Engineer-Systems Maintenance and Planning for BNSF. From 2005 through my retirement in April 2012, I was responsible for coordinating and overseeing the implementation of BNSF's program for curtailing coal dust losses in transit. I previously submitted verified statements in the proceeding *Petition of Arkansas Electric Cooperative Corporation for a Declaratory Order*, STB Docket No. 35305 ("*Coal Dust I*"). In my previous testimony, I described the measures that BNSF took from 2005 to May 2010 to understand the impact of coal dust on the safety and reliability of Powder River Basin ("PRB") coal transportation. I also described BNSF's efforts to keep its shippers informed of BNSF's coal dust study and our investigation into approaches for curtailing in-transit coal dust losses in the PRB.

I am submitting this verified statement to describe the studies and tests carried out in the PRB that led BNSF to adopt the specific approach to coal dust mitigation that is reflected in the safe harbor provisions in BNSF's Coal Loading Rule contained as Exhibit 1 to BNSF's Counsel Argument. I also explain why compliance with the safe harbor provisions in BNSF's Coal Loading Rule will effectively reduce in-transit coal dust losses without undue cost or burdens on our shippers, who will benefit from the increased reliability of BNSF's coal transportation network and from the additional coal that will be available to them at their electricity generating facilities because it is not lost during transit.

I. BNSF's Preliminary Studies Showed That Grooming The Profile Of The Loaded Coal And Applying A Topper To The Loaded Coal Would Effectively Reduce Coal Dust Losses In Transit.

I explained in detail in my testimony in *Coal Dust I* that BNSF undertook an extensive study of coal dust in the aftermath of two back-to-back coal train derailments in the PRB in the spring of 2005. From 2005 through 2009, BNSF thoroughly studied the causes of coal dust losses from loaded cars, the impact of coal dust losses on the integrity of track ballast in the PRB, methods for reducing coal dust losses in transit, and ways to monitor coal dust losses from individual trains.[1]

I also explained that we worked extensively with our coal shippers and PRB coal mines during this process. The National Coal Transportation Association ("NCTA"), an organization of coal shippers, mines, and rail equipment manufacturers that deals with a range of issues involving coal transportation, formed committees to look into coal dust issues, and we met many times with the NCTA committees to discuss developments in our coal dust study and to address questions, thoughts, and concerns by NCTA's members. *Coal Dust I*, VanHook Op. VS at 8-12. We carried out a number of studies directly at the urging of NCTA members. In my prior testimony, I noted that we spent over $4 million on coal dust study efforts from 2005 through 2009, which included nearly $2 million on efforts to respond to NCTA members' questions.[2] In the subsequent efforts since March 2010 that are discussed below, I estimate that BNSF has

[1] Verified Statement of William VanHook in Support of BNSF Railway Company's Opening Evidence, *Petition of Arkansas Elec. Coop. Corp. for a Declaratory Order*, STB Fin. Docket No. 35305, at 3-22 (filed Mar. 16, 2010) ("*Coal Dust I*, VanHook Op. VS").

[2] *Coal Dust I*, VanHook Op. VS at 9.

spent an additional $2.5 million on consultants alone to study and field test methods for curtailing in-transit coal dust losses.

At the outset of our coal dust study, we retained two consulting firms to help us understand the extent of the coal dust problem in the PRB and to investigate possible solutions: Simpson Weather Associates ("SWA") and Conestoga-Rovers & Associates ("CRA"). SWA had worked extensively in the 1990s with Norfolk Southern to develop a coal dust remediation program for coal moving to export facilities on the Eastern Seaboard. The approach that SWA had developed for Norfolk Southern involved a combination of (1) grooming the top of the coal when the coal is loaded into railcars at the mine, and (2) applying chemical topper agents to the groomed coal. BNSF decided to investigate the feasibility of adopting such an approach in the PRB.

Load Profile Grooming

With the help of the President of SWA, Dr. G. David Emmitt, we identified an aerodynamic load profile in the shape of a breadloaf for PRB coal that would minimize the effect of wind, which causes coal dust to blow out of a moving car. The profile is set out in Appendix A of BNSF's Coal Loading Rule. *See* Counsel's Exhibit 1. The Verified Statement of E. Daniel Carré, SWA, Assistant Director—Environment & Energy Division, and Mark Murphy, CRA, Vice President/Principal, which is being submitted with BNSF's Opening Evidence in this proceeding, describes in more detail the development of the load profile by SWA and BNSF's subsequent efforts to assist mines to adopt modified loading chutes that would allow coal to be loaded in conformance with the proper load profile for PRB coal.

In 2005 and 2007, we conducted tests to determine the extent to which the proper grooming of coal would reduce coal dust losses. The tests showed that while grooming the coal load profile on its own would on average reduce coal dust losses, the data did not indicate that grooming would produce consistent or sufficient reductions in coal dust. As Exhibit 1 shows, of {

} Exhibit 1 at 9, 13, 16.[3] In 2007, we supplemented these early tests by looking at coal dust deposited in dust collector jars set up on the side of the PRB rail lines, which are pictured in Exhibit 2 on page 2. We looked at the amount of coal dust in the dust collectors during a period of time when no grooming was conducted and compared that to the amount of coal dust in the dust jars during a period when the PRB mines had all begun to groom coal but had not begun applying any topper agents. While this was not a rigorous test, as shown in Exhibit 2, the reduction in coal dust deposits was relatively modest, about { }. Exhibit 2 at 3.[4]

Topper Application

Topper agents have long been used to curtail coal dust from stationary coal stockpiles and from loaded coal cars in transit. Norfolk Southern used topper agents in its efforts to control coal dust in the East. As explained by Messrs. Carré and Murphy in their verified statement, toppers are broadly used outside the United States to address coal dust losses from railcars in transit. *See* Carré-Murphy VS at 12-14. Topper agents form a pliable crust over the top of the loaded coal that keeps the wind from blowing coal dust out of a coal car or off the top of a coal stockpile. Most topper agents are non-toxic, environmentally safe, and easy to use. I have been informed

[3] Passive collectors are described in further detail below. Exhibit 1 to this verified statement is an excerpt from Exhibit 5 to my opening verified statement filed in *Coal Dust I*. Confidential materials are designated by a single bracket – "{" – and Highly Confidential materials are designated with double brackets – "{{".

[4] Exhibit 2 is an excerpt from Exhibit 19 to my opening verified statement filed in *Coal Dust I*.

by our shippers that they performed laboratory testing on the toppers we evaluated, and they determined that the toppers do not affect the heat generating capacity of the coal to which they are applied, and they do not have adverse effects on boilers at their electric generating facilities.

There is a well-established and active commercial market for coal dust suppression products, including products that are specifically designed to be applied to coal in loaded rail cars. Since I began coordinating BNSF's program for curtailing coal dust losses in transit, the market for in-transit dust suppressants has noticeably increased in size, as manufacturers have improved their existing products, increased marketing efforts, and developed new products. I have attached to this statement at Exhibit 3 the commercial materials of several vendors of coal dust suppression chemicals to illustrate the extent and depth of this market. As described in the materials included in Exhibit 3, the dust suppression products available from suppliers of topper agents include the following:

- AKJ's CTS-100 is "comprised of all organic components . . . and [it] continues to draw moisture from the air to maintain dust control even days after initial application." AKJ Industries, Rail Car, CTS-100, Exhibit 3 at 1.

- Applied Australia's veneer forms "a specially designed membrane film for the suppression of dust during the transport and storage of coal." The chemical is "readily biodegradable" and contains a "[n]on-solvent, non hazardous formulation that does not effect the further processing of coal." *Applied 3152C: Dust Membrane Technology (DMT)*, Exhibit 3 at 2.

- Benetech provides a broad range of dust control services, including encrusting agents that "are designed to produce a semi-permanent shell over your material . . . [and] provide excellent pile sealing, slope control and rail car topper solutions." Benetech, *Dust Suppression: Improving Safety and Emissions*, Exhibit 3 at 5.

- Dupont's Dusgon Dust Suppression Agents can "effectively suppress dust all year round," including dust from railcars and stockpiles. The Dusgon products are "non hazardous, simple and easy to apply." *Dupont Dusgon™ Dust Suppression Agents*, Exhibit 3 at 8.

- Midwest has a long history of coal dust toppers used to suppress in-transit dust. Midwest began spraying loaded coal cars for in-transit dust suppression in 1994 in the PRB. *Midwest: Coal Car Topping – Dust Control for Coal in Transit*, Exhibit 3 at 11.

- MinTech has been { } and its MinTopper S+0150 "[t]ypically provides 90 – 180 days residual dust suppression." MinTech Enterprises, *MinTopper™ S+0150*, Exhibit 3 at 40; *see also* { } Exhibit 3 at 50.

- Nalco's topper agents have been used on {{ }} Exhibit 3 at 80, 85, 87.

- Rantec's Capture 3000 is a {{ }} Exhibit 3 at 99.

BNSF carried out several tests in the PRB of the effectiveness of topper agents in 2005 and 2006. These early tests were the precursor to the large-scale tests that BNSF carried out in the Super Trial and employed a test protocol that is similar to the protocol we used in the Super Trial. I describe the test protocol in detail below in my discussion of the Super Trial. The preliminary tests we carried out showed that the application of topper agents could substantially reduce coal dust losses in transit. The results of these preliminary tests in 2005 and 2006 showed an average in-transit dust reduction from treated cars that ranged from { } as compared to untreated cars.[5] *See* Exhibit 4 at 8.

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5 { } Exhibit 4 at 4-7. Exhibit 4 contains an excerpt from Exhibit 5 to my opening verified statement in *Coal Dust I.*

Coal shippers, through the NCTA, also carried out tests on the effectiveness of topper agents to suppress coal dust. In 2008, we helped NCTA carry out a series of field tests in the PRB on coal trains loaded by Peabody, a coal producer that owns three PRB mines. {

} reduction. *See* Exhibit 5 at 5, which summarizes the results of the passive collectors from the field tests performed by NCTA and Peabody in 2008.[6] Indeed, Midwest's toper agent achieved { } *See* Exhibit 3 at 22. NCTA also commissioned Exponent, Inc., an engineering consulting firm, to carry out additional tests on the effectiveness of topper agents in 2008. As explained in more detail by Messrs. Carré and Murphy, Exponent found that the use of topper agents on groomed coal loads can {

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II. In 2010-2011, BNSF Carried Out Extensive Laboratory And Field Tests To Identify The Most Effective Topper Agents That Are Commercially Available.

By 2009, our preliminary studies were complete, and we concluded that it was time to begin implementing coal dust mitigation measures. BNSF established its first coal dust tariff, which was the subject of the proceedings in *Coal Dust I*. In addition, BNSF responded to requests from its shippers to help them identify the most effective topper agents available for use in controlling in-transit coal dust by organizing and conducting a large scale field test of coal dust remediation measures, which was subsequently referred to as the Super Trial. The objective

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[6] The report from Exponent Inc., which describes the tests carried out by NCTA and Peabody, is on the CD attached herein to BNSF's Opening Evidence and Argument. The report was included on the CD filed with BNSF's Reply Evidence and Argument in the materials for the Verified Statement of Dr. G. David Emmitt in *Coal Dust I*.

of the Super Trial was to test the effectiveness of selected chemical agents in the suppression of coal dust, both topper agents and chemicals applied to coal before loading called body treatments, and to develop information that would assist our coal shippers to choose among the various products available in the market for coal dust suppression.

The Super Trial was a collaborative effort between BNSF, PRB mines, and PRB coal shippers. In addition, Union Pacific Railroad Company, the co-owner of the Joint Line, participated in the Super Trial. We invited all BNSF shippers and mines to participate in the Super Trial tests. Thirteen shippers agreed to have the tests carried out with their coal. More than 36 million tons of coal were ultimately committed for testing. Three coal producers volunteered to have topper agents tested at four mines. Several other shippers and mines participated in the Super Trial by attending the Super Trial meetings and receiving Super Trial data, even though their trains were not tested.

Before the Super Trial began, in December 2009, we met with interested shippers and mines to seek their input on the tests that we were proposing to carry out. We described for the participants the testing protocols and procedures that we were planning to implement. We shared the test plan with shippers, which I have attached to this statement at Exhibit 6, and solicited their feedback. We subsequently met with the shipper and mine participants in large group meetings on four separate occasions between March and October of 2010 to discuss planning and progress and to address questions. Exhibit 7 contains the agendas for those meetings. *See* Exhibit 7 (agendas for meetings in March, May, August, and October 2010). At the meetings, we reviewed results from the tests to date, provided updates about testing, and responded to questions. In addition to the information distributed and discussed at in-person meetings, we provided regular reports and updates to the Super Trial participants and distributed extensive data regarding the test trains. Exhibit 8 contains an e-mail to shippers in April 2010, which illustrates the amount of data and results we shared regularly with the participants in the Super Trial. We also shared with each shipper that volunteered tons in the Super Trial the results for their trains tested in the Super Trial.

At the outset of the Super Trial, a Selection Committee consisting of shippers and mines was created to determine which topper agents and body treatment chemicals would be tested in the Super Trial after BNSF selected the first few chemicals to get the Super Trial started. The Selection Committee appointed { } as the Chair and Co-Chair of the committee. The Selection Committee included employees from several other PRB coal shippers, including { }, as well as from coal producers, including { }. The Selection Committee operated independently of BNSF. Our role in the Selection Committee was limited, and we had no voting rights. To illustrate the scope of issues addressed by the Selection Committee, Exhibit 9 includes an agenda from the Super Trial Selection Committee meeting on March 25, 2010.

Laboratory Tests

The first part of the Super Trial consisted of laboratory tests by BNSF's Technical Research & Development ("TR&D") Department in Topeka and by BNSF's consultants at SWA on the toppers to be evaluated. These tests were carried out before any field tests were done. SWA performed various lab tests to determine whether the particular chemical being tested had the ability to form a pliable crust that could reduce in-transit coal dust. SWA studied each topper agent for the strength of the crust, penetration depth, the ability of the chemical to stabilize the coal surface, and the ability of the chemical to withstand rain, hot and cold temperatures, and wind exposure. Exhibit 10 contains a SWA test report for Nalco's Dustbind Plus. BNSF's

TR&D Department in Topeka tested the chemicals to determine whether they had properties that could be dangerous or damaging to railcars. For example, BNSF's TR&D Department looked at whether the chemical would have an impact on painted surfaces and whether it would corrode aluminum. The TR&D Department's tests also examined the product's pH and whether it would dry tack free, or non-sticky to the touch. Attached at Exhibit 11 is a TR&D report for Nalco's Dustbind plus.

In some cases, the lab tests identified problems or concerns with particular chemical agents, and we worked with the chemical vendors to see whether the issues we identified could be resolved. For example, {

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<u>Passive Collector Tests</u>

The primary focus of the Super Trial was a series of field tests of PRB trains using passive collectors to identify the most effective topper agents that are commercially available to control coal dust in transit. The use of passive collectors to measure coal dust losses in transit was discussed in *Coal Dust I*. *See Coal Dust I*, VanHook Op. VS at 8; *Coal Dust I*, Emmitt Op. VS at 12. As explained in that proceeding, a passive collector is a device that is mounted on the rear sill of an individual coal car. The collector allows air containing dust particles to pass through the device as the train moves while depositing the dust in a container inside the collector that can be removed at the end of the train trip. A picture of a passive collector is attached at Exhibit 12 at 4.

Passive collectors are used to measure the relative amount of coal dust losses from treated and untreated cars. To carry out the passive collector tests, half of the cars on a particular test train were treated with the dust suppressant, and half of the cars were untreated. The passive collectors were mounted on the rear top chord of 7 of the treated cars and 7 of the untreated cars of the test train. Dust collected in each of the passive collectors was gathered by the consultants assisting BNSF in the Super Trial and sent to BNSF's TR&D laboratory in Topeka, where the dust was dried and weighed. The amount of coal dust collected from treated and untreated cars was then compared to determine the extent to which coal dust was reduced by the application of a topper. 115 trains were tested using these procedures.

Test trains using passive collectors were also equipped with portable weather stations that measure wind, air temperature, coal surface temperature, and precipitation. The precipitation monitors were important because they allowed us to exclude trains from the tests that moved during rain storms. Water naturally suppresses coal dust, so the results of the passive collector tests would be distorted by including trains that experienced significant rain.

Attached as Exhibit 12 is a report of the Super Trial results that BNSF sent to all of its PRB coal shippers in February 2011. BNSF also posted the report on its website, which is available at www.bnsf.com/customers/pdf/coal-super-trial.pdf. As explained in Exhibit 12, the passive dust collector tests showed that there was a 73% to 93% reduction in coal losses depending on the topper agent being tested. *See* Exhibit 12 at 7. Exhibit 13 contains a summary of the test results on each chemical tested in the Super Trial, which we sent to shippers in November 2010. We also discussed the passive collector results with shippers at the in-person meetings during the Super Trial. Three topper agents achieved 85% or more reduction in coal dust losses on average during the Super Trial as measured by the passive collectors: Nalco DustBind Plus (93%); Midwest Soil Sement (92%); and AKJ CTS-100 (85%). *See* Exhibit 12 at 7. Exhibit 14 has the results from the passive collector tests for Nalco's DustBind Plus from September 2010.

After the Super Trial tests were completed, shippers and mines sponsored passive collector tests for two additional topper agents, Rantec Capture 3000 and MinTech MinTopper S+0150. The tests were carried out in August and September 2011 using the same basic procedures as those used in the Super Trial. The passive collector results showed that when railcars were treated with MinTech's MinTopper S+0150 and Rantec's Capture 3000, coal dust losses were reduced on average by { } respectively.

Based on the results of the passive collector tests in the Super Trial and the subsequent field tests, BNSF's safe harbor tariff provision currently approves the use of five topper agents that were shown to reduce coal dust losses by at least 85%. One of the topper agents, AKJ, is approved in two forms: concentrate to be mixed with water and pre-mixed with water. *See* Appendix B to BNSF's Coal Loading Rule, attached at Counsel's Exhibit 1. BNSF recognizes that other products may also prove to be effective in reducing in-transit coal dust losses, and we have encouraged further testing as additional products become available. Moreover, the safe harbor contains a provision allowing shippers to seek safe harbor treatment for other dust mitigation approaches if the shippers can show that the proposed measures will reduce coal dust losses by at least 85%, the benchmark we used to identify the safe harbor toppers that are now included on the approved topper list. As we begin to move toward broader compliance with BNSF's coal dust loading rule, I expect that market demand will lead to the availability of new dust remediation products and methodologies. For example, I understand that in summer 2012,

{

}

Trackside Monitor Data

As BNSF explained in *Coal Dust I*, BNSF has set up trackside monitors at certain fixed locations along the Joint Line and BNSF's Black Hills Subdivision. The trackside monitors are towers equipped with weather monitors and a sophisticated optical monitor that measures dust in the air as a train passes. The optical monitors determine the total amount of dust in the air over the time period that the train passes the monitor and reports the dust level as an Integrated Dust Value ("IDV.2").

I will not get into the details here about how the monitors work or how coal dust is measured by the optical monitors. The optical monitors were not used in the Super Trial to identify the effectiveness of individual topper agents, and they are not otherwise relevant to BNSF's safe harbor. Nevertheless, the data that were collected by the trackside monitors over the course of the Super Trial are useful for diagnostic purposes and confirmed the effectiveness of topper agents in reducing in-transit coal dust losses from treated trains as compared to untreated trains. Trackside monitor readings were taken from more than 1,000 trains during the Super Trial. As shown in the Super Trial Report contained at Exhibit 12 and discussed in the Verified Statement of Messrs. Carré and Murphy, the IDV.2 level for the 90th percentile of trains was substantially lower for treated trains than for untreated trains on the Joint Line and Black Hills Subdivision. *See* Carré-Murphy VS at 16.

Alternative Coal Dust Mitigation Approaches

The Super Trial and follow up tests also looked at the effectiveness of two alternative in-transit coal dust suppression methods, the use of body treatments and compaction. Neither approach was shown to significantly reduce coal dust.

Several shippers have their mine agents apply a body treatment chemical to all of the shipper's coal before it is loaded into rail cars. The purpose of the body treatment is to reduce coal dust in the handling of the coal when the coal arrives at the plant, particularly in the unloading of coal where substantial amounts of dust are produced. My understanding is that PRB mines and shippers must comply with a number of environmental, health, and safety regulations relating to coal dust. A number of the shippers participating in the Super Trial wanted to know whether the body treatments that mines were applying and that were already used for coal dust suppression at their electric generating facilities would also be effective in reducing coal dust in transit. BNSF agreed to assist in testing the effectiveness of certain body treatments during the Super Trial.

As shown in the Super Trial Report, there was no statistically significant reduction in coal dust losses in transit where the coal had been treated with the tested body treatment chemicals as compared to the untreated coal. *See* Exhibit 12 at 7. The trackside monitor tests similarly showed only a limited reduction in coal dust losses from the use of body treatment chemicals. While disappointing, these results were not surprising in the context of in-transit dust suppression. The topper agents work by forming a crust over the loaded coal, which keeps the air movement from dislodging coal dust particles. In contrast, body treatments do not form a crust over the loaded coal. The body treatment helps prevent coal from breaking down into smaller particles throughout the entire volume of coal in the coal car, but it does not prevent the wind from blowing particles that have already formed in the mining and car loading process from being blown out of the loaded cars in transit.

Several Super Trial participants also wanted BNSF to assist in testing the effectiveness of compaction technology, where coal that has been loaded in a rail car is compacted into a smaller and denser volume using a combination of vibrating plates and a profiling plow. The vibrating plates are intended to settle coal farther down in the car, shift finer particles towards the bottom of the car, and compact the coal down to the car's top chord. Compaction field tests were carried out in June through July 2011 using passive collectors.

The results of the tests demonstrated that compaction was not effective in reducing in-transit coal dust losses. Compacted cars actually had more in-transit coal dust losses compared to uncompacted cars. The problem appeared to be that the compaction process itself created substantial additional amounts of coal dust by crushing coal lumps, concentrating much of the dust at the top of the loaded car, which was therefore susceptible to the wind.

The results of these alternative tests confirmed our conclusion that the approach set out in the safe harbor provision of BNSF's Coal Loading Rule – use of topper agents applied to groomed coal cars – is the only currently feasible approach to reducing coal dust from loaded cars in transit. We are hopeful that other approaches will be developed, and BNSF's safe harbor provisions expressly provide that we will add those approaches to the safe harbor when and if they are shown to effectively reduce coal dust losses. For now, however, no one has identified a viable and commercially feasible alternative to the measures that are set out in the safe harbor for controlling coal dust losses in transit.

III. The Measures Set Out In The Safe Harbor Are Straightforward And Cost-Effective.

The application of topper agents along with coal load profiling is a feasible means of dealing with the coal dust problem. All PRB mines have already installed loading chutes capable of producing groomed loads. The equipment needed to apply the toppers is not very sophisticated or complex to use. Indeed, all of the major PRB mines now have the facilities necessary to apply topper agents to their customers' coal. The chemical toppers are widely available. The mines are just waiting for their shippers to instruct them to start complying with BNSF's Coal Loading Rule.

Compliance with the safe harbor will effectively reduce coal dust losses in transit without imposing substantial costs on the shippers. The costs of complying with BNSF's safe harbor are modest and would not add significantly to the total delivered cost of coal for use at coal-fired electric generating facilities. While BNSF is not involved directly in the procurement of topper agents for use at the mines, the information available to BNSF indicates that the cost to apply toppers is generally in the range of {{ }}.[7] These costs include the costs for the infrastructure used to apply the toppers.[8] The cost to apply toppers is far lower than the cost estimates that were made in *Coal Dust I*. In *Coal Dust I*, WCTL's witness Mr. Crowley estimated the cost of applying toppers could be as much as {{ }}[9] I would expect the cost of toppers to come down further as more shippers begin fully complying with BNSF's Coal

[7] The mines are currently using approved topper agents from MinTech, AKJ, and Midwest, and costs of those topper agents are included in Exhibit 15.

[8] The infrastructure used to apply toppers is relatively simple. I understand that one mine received an estimate for an indoor spray facility in the amount of {{ }}

[9] *Coal Dust I*, Crowley Op. VS at 6.

Loading Rule and additional suppliers of topper agents and additional topper agents enter the market.

These costs are a small fraction of the cost per ton of delivered coal. To illustrate, a typical coal movement of about {{ }} would likely have a delivered cost of coal around {{ }} If the application of a topper agent costs approximately {{ }} – the average of the costs identified above – topper costs would be less than {{ }} of the delivered cost of the coal.

Moreover, any attempt to estimate the costs associated with the application of topper agents should take into account the fact that application of toppers will keep the shipper's coal in the rail cars and available for use in producing electricity. One of the chemical vendors whose topper agent has been approved for use in the safe harbor, {{

}} *See* Exhibit 3 at 82.

IV. Conclusion

The actions contemplated by the safe harbor provision in BNSF's Coal Loading Rule are commercially feasible and cost-effective ways to address coal dust losses from railcars in transit in the PRB. In-transit coal dust losses in the PRB needs to be brought under control, and BNSF's safe harbor sets out a reasonable means of dealing with the coal dust problem.

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 September 28th, 2012

William VanHook

VANHOOK EXHIBITS

EXHIBIT 1

EXHIBIT 1
IS CONFIDENTIAL

EXHIBIT 2

EXHIBIT 2
IS CONFIDENTIAL

EXHIBIT 3

AKJ INDUSTRIES

Category:	Rail Car
Product Name:	CTS-100
Product Description:	CTS-100 is a unique product comprised of all organic components. It is non-hazardous and functions via binding the fine dustable particles to the larger pieces of coal and forming a thick, pliable and strong film coating the surface. It has hydroscopic properties and continues to draw moisture from the air to maintain dust control even days after initial application. Testing at an independent laboratory concluded: CTS 100 has shown merits of being an effective low water usage coal dust suppressant. Thin, pliable, and continuous crusts that suppressed coal dust were observed during initial testing.
Industry:	Steel Industry ; Mining Industry ; Quarry Industry ; Utility Industry

Back to Results

PRODUCT INFORMATION

Applied Australia Pty Ltd (ABN 96 082 810 973) 92 FAIRBANK ROAD CLAYTON SOUTH VICTORIA 3169
Telephone (03) 8542 5111 Facsimile (03) 8542 5188
The Applied Group of Companies has Offices in: Australia, New Zealand, Asia & Europe.

APPLIED 3152C

Dust Membrane Technology (DMT)

PRODUCT DESCRIPTION AND USE:

DMT (Applied 3152C) is a specially designed membrane film for the suppression of dust during the transport and storage of coal and mineral ores. Initially designed as a veneer coating system, **DMT** is now finding application where bulk ore treatments are needed. When sprayed on to the surface or dispersed within the bulk of the coal or mineral ore, the liquid phase evaporates leaving a flexible film, binding particles to prevent dust formation.

DMT is administered by spray, either as a veneer or bulk coating, prior to transport. The product is used at ambient temperature.

DMT offers an environmentally acceptable method of controlling dust as it does not contain petroleum fractions, oil, heavy metals or other materials that may impact on the surrounding environment or produce harmful by-products during subsequent processing operations.

DMT is operator safe and easy to use. Automatic dosing systems are available to minimise exposure during application. **DMT** is not a skin or respiratory irritant and has only a mild and transient irritant effect on eyes. **DMT** is not hazardous by ingestion.

DMT will not cause any adverse effects on downstream operations such as stockpile recovery and thus will not increase handling costs.

BENEFITS:

- Non-solvent, non hazardous formulation that does not effect the further processing of coal or mineral ores.
- contains specially selected wetting agents that ensure an even coating over the surface.
- Made up solutions are specially formulated to minimise misting and thus reduce losses in high wind conditions.
- Readily biodegradable and does not contain polymers that may degrade to harmful by-products.
- Safe to use and environmentally acceptable.
- Easily diluted and mixed with water.
- Provides very effective veneer coatings at low application rates per sq. metre.

PRODUCT CHARACTERISTICS:

Appearance:	Opaque slightly viscosity liquid
S.G.:	1.00
pH (neat):	5.0
Classified as:	Non-hazardous.
Flash Point:	Non Flammable

DIRECTIONS FOR USE:
DMT should be prediluted to the required concentrations prior to spraying on the coal or mineral ore.

For Veneer coatings, predilute to 3-4% v/v and apply the diluted mixture at a rate of 15 to 18 litres per 100 sq. metres, for both stockpiles road verges, and the surfaces of transport vehicles.

For bulk treatment of materials, pre-dilute to 0.25-1.0% v/v and apply at the rate of 15-30 litres per tonne of material to be treated. This will provide an application rate of 37.5 to 300 ppm DMT. Spray systems are recommended to be installed at points of maximum turbulence to maximise coating of all particle surfaces.

DMT is a water soluble treatment and therefore its performance will be diminished should the coal or mineral ore be subjected to cyclic weather conditions involving rain. Where stockpiles are exposed to rain, followed by periods of high temperature conditions, it is recommended that a light veneer coating be applied.

Dilutions

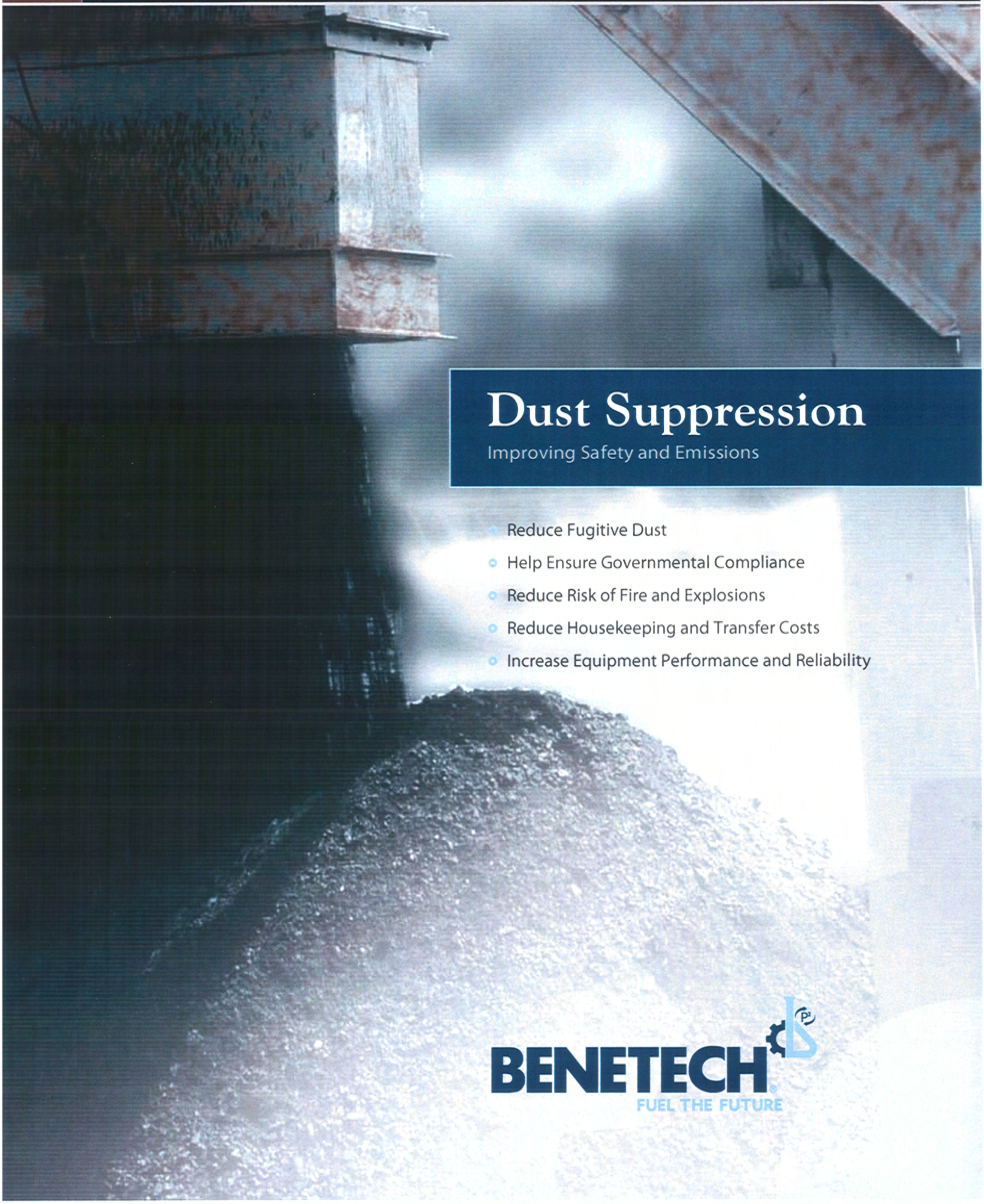
Veneer coatings :- use at 3 - 4% v/v and 15-18 litres / 100 sq. metre.
Bulk coatings :- use at 0.25 -1.0% v/v concentration and 15-30 lts per tonne (38 - 300 ppm dosing rate.)

MATERIALS OF CONSTRUCTION COMPATABILITY:
Compatible with most materials of construction

HANDLING PRECAUTIONS:
NON-HAZARDOUS
Refer to label or MSDS for further safety information

For further information, please consult the Materials Safety Data Sheet.

SUPPRESSION
SYSTEMS



Dust Suppression

Improving Safety and Emissions

- Reduce Fugitive Dust
- Help Ensure Governmental Compliance
- Reduce Risk of Fire and Explosions
- Reduce Housekeeping and Transfer Costs
- Increase Equipment Performance and Reliability

BENETECH®
FUEL THE FUTURE

A Lot of Companies Sell Chemicals. We Provide Experience and Results.

As an important part of our Total Dust Management product line, Dust Suppression is an area that we take seriously. Benetech understands that suppression is more than chemical. It is a customized program that involves tested and proven suppression products, best-in-class engineered application systems, extensive knowledge in application technology and a qualified, service-driven team of technicians for on-going support and maintenance.

With our comprehensive approach, we are committed to exceeding your expectations in each of these areas, making sure your reduction needs are met.

BENETECH®
FUEL THE FUTURE

Chemical dust suppression is recognized by the EPA as "Best Available Control Technology (BACT)" in a variety of material handling applications.

Special Application Chemicals:

- Coal Flow Enhancer (CFE)
- Fireade
- Freeze Gas Conditioners (FGC)

Superior Chemical Technology

Benetech's renown, top-notch team of Chemists performs product research and development on a continual basis at the on-site Laboratory Facilities. Our chemicals must pass a wide range of tests before they get our seal of approval. The result is a proven product line of chemical suppression that helps you achieve optimum safety and compliance levels.

- Encrusting Agents

Benetech's lines of encrusting agents are designed to produce a semi-permanent shell over your material. This coating protects against rain and wind erosion, reducing your maintenance costs and improving your safety. These products also prevent air from entering, which minimizes oxidation in sealed piles, and reduces the risk of spontaneous combustion. Benetech's encrusting products provide excellent pile sealing, slope control and rail car topper solutions.

- Residual Agents

Our line of residual agents prevent coal from becoming dusty on storage, minimizing both immediate and long term dust issues. Using a full body application, these products reduce or eliminate the clouds of fugitive dust that can occur. These products will help control airborne dust generated during the conveying process and minimize fugitive dust problems associated with stackout, stock piles, railcar and hopper unloading feeders and conveyor transfers.

- Foam Agents

The Benetech family of foaming agents use patented technology to combine foaming and wetting characteristics allowing it to mix easily with water; lowering required moisture for effective dust control and maximum BTU. Applied directly to difficult impact areas, the foam covers and then captures air born dust. Benetech's foaming surfactant blends are used for reducing dust levels occurring above and below ground in the mining, transportation, and processing of coal and other fine solids. Primary uses include reclaim application where minimizing moisture addition to the boiler is critical, crusher windmill and applications where additional moisture can lead to chute pluggage.

- Wetting Agents

Benetech's wetting agents are designed to increase waters ability to wet dust particles and suppress material emissions, allowing you to control dust more effectively with less mess and less moisture. The relatively high surface tension of water (72 dynes per centimeter) is a basic reason why water alone is insufficient to effectively penetrate crushed coal, rock or other fibrous materials. The water surface is too hard, resulting in water particles bouncing off of dust particles instead of wetting them. Adding wetting agents to water reduces the surface tension to 28-36 dynes per centimeters, thereby improving its ability to wet particles, penetrate rock or coal and reduce dust. The end result is less equipment at fewer application points and reduced installation costs. These surfactants are the best technique for quickly and easily suppressing dust in rapid material movement applications such as conveyor transfers; rotary car and bottom dump rail car unloaders and ship and truck unloading hoppers.

- Fly Ash Conditioners

Treatments with these cost effective conditioners significantly reduces fly ash. They work as a set retardant, delaying hardening and decreasing strength. The result is easy and efficient clean up of pug mills. A simple hose will remove ash for transfer instead of labor intensive, high energy removal methods.

Proven Application Techniques

When it comes to Dust Suppression Systems, our knowledge is unmatched. Our approach has resulted in successful year round dust control for over 880 million tons of coal with minimal moisture. We have installed hundreds of systems to an extensive list of customers and are the industry leader in meeting the material handling challenges of PRB Coal. Our experience and knowledge allow us to develop superior and diverse application technologies found nowhere else.

Applications

- Pile Sealant
- Rail Car Topper
- Truck Top Sealants
- Slope Encrusting
- Stackout Suppression
- Transfer Points Suppression
- Rail Car Unloading
- Conveying Systems
- Haul Road
- Anti Oxidizers

State-of-the-Art System Design

For over 25 years, Benetech's engineering team has been dedicated to the custom design, fabrication and installation of Dust Suppression Systems. Our automated application systems are reliable and easy to maintain. Once our systems leave the shop, you can be sure that they will operate in the most extreme conditions; maximizing cost effectiveness and performance.

Chemical Dust Control Systems

- BenePaks
- Sheds
- Piping
- Spray Manifolds
- Foam Generators
- PLC/HMI Controls
- Yard Sprays
- Water Cannons

Outstanding Maintenance

Our service sets us apart. Benetech's fully trained field technicians are on call 24/7 providing on-site technical service and on-going maintenance. They are fully equipped at all times with the tools and replacement parts needed to keep your systems running properly and to ensure your material handling needs are met.

Support & Maintenance

- Equipment Startup & Personnel Training
- System Performance Analysis
- Dust Monitoring
- Annual Management Reports

Before/After Benetech Dust Suppression System

Suppression Products and Chemicals at Work

State-of-the-art Design Components

Proven Effectiveness & Satisfaction

Dust is a pervasive problem when handling many bulk materials such as coal, interfering with all aspects of your operation. Benetech's Dust Suppression Systems help you take control of dust while improving efficiency. Our effective, low cost solutions integrate customized levels of operational control and help you meet OSHA regulations.

For over 25 years, Benetech's engineering team has been dedicated to the design, fabrication and installation of Dust Suppression Systems. Our technicians have maintained and strengthened solution implementation by working with our customers to ensure safe operation, system efficiency and compliance optimization. Our approach has resulted in successful year round dust control for over 880 million tons of coal with minimal moisture. Our effective, low cost solutions integrate customized levels of operational control while helping you meet OSHA regulations, reduce housekeeping costs and increase operational efficiency.

Through engineered innovations, we have become the leader in Dust Suppression products and chemical applications to the utility, mining, steel cement and aggregate industries.

BENETECH
FUEL THE FUTURE

Benetech helps clients around the globe increase profits while improving the safety of their operations through risk mitigation, asset optimization and fuel flexibility. Contact us today to learn how we can help you take advantage of Benetech's turnkey capabilities.

1851 Albright Road | Montgomery, Illinois 60538 | p: 630-844-1300 | f: 630-844-8690 | www.benetechusa.com |

DuPont Dusgon™ Dust Suppression Agents

Designed to solve some of the most challenging dust problems of the mining and construction industries.

Fugitive dust emissions that result from mining activities can pose serious Health, Safety and Environmental issues for workers, mine operators, local communities, regulatory bodies and governments.

DuPont Dusgon Dust Suppression Agents have been specially formulated and extensively tested to solve some of the most challenging dust emission problems of the mining and construction industries. The Dusgon products were developed for optimal performance but with special consideration to minimizing Occupational Health and Safety issues, Environmental impact and impact on the downstream use of the mined materials.

From the mine to the port, through various processing steps, transportation and storage, Dusgon helps reduce dust emissions and product loss. The Dusgon dust suppression technology uses unique combinations of water based polymer dispersions and additives that wet and bind dust particles into a crust or 3 dimensional matrix.

The products in the Dusgon range are non hazardous, simple and easy to apply. They can be used with existing water spray systems or in a delivery system designed for your application. The range can be applied to most dusty material and effectively suppress dust all year round. Products are specially formulated for different dusty material like coal and iron ore and a range of dust emission sources such as:

- Unsealed roads
- Stockpiles
- Rail wagons
- Transfer points
- Cleared, unvegetated or open areas.

Coupled with a proper dust control and management system, Dusgon products can help you control fugitive dust emissions.

Product advantages

- Non hazardous
- Low ecological toxicity
- Low environmental impact
- Low odour
- Aqueous dispersion, mixes easily with water
- Simple & easy to use
- Quick drying time
- Dries clear / transparent
- Non corrosive & safe for all equipment
- Non regulated for land, ocean and air transportation
- Non volatile, non flammable
- Non slippery
- Once dried, will not dissolve or break down with water
- Dyes & pigments can be added for colour

Dusgon products do not contain:

- Heavy metals
- Organochlorides
- Petroleum by products
- Solvents
- Oils
- Salts

Benefits of DuPont™ Dusgon Dust Suppression Agents

- Fast effective wetting of most dusty material
- Effectively binds dust and reduces emissions (larger particles down to PM10 and PM2.5) from most dusty material
- Does not change the essential properties of the material
- Does not affect material processing and end use
- Can use existing infrastructure and equipment to deliver treatments
- Cost effective compared to other dust control measures
- Cumulative effect with repeated use
- Savings on water and labour costs

Local Application Assessment and Technical Support

Depending on the material and the situation where dust suppression is required, we will work with you to determine the best product and solution for your application. DuPont has global resources and expertise combined with local technical support to offer a complete service from initial assessments, laboratory tests, system design, field trials right through to the ongoing service and maintenance of your dust suppression system.

To find out which product is best suited to your dusty material or application, please contact your DuPont Dust Suppression representative.

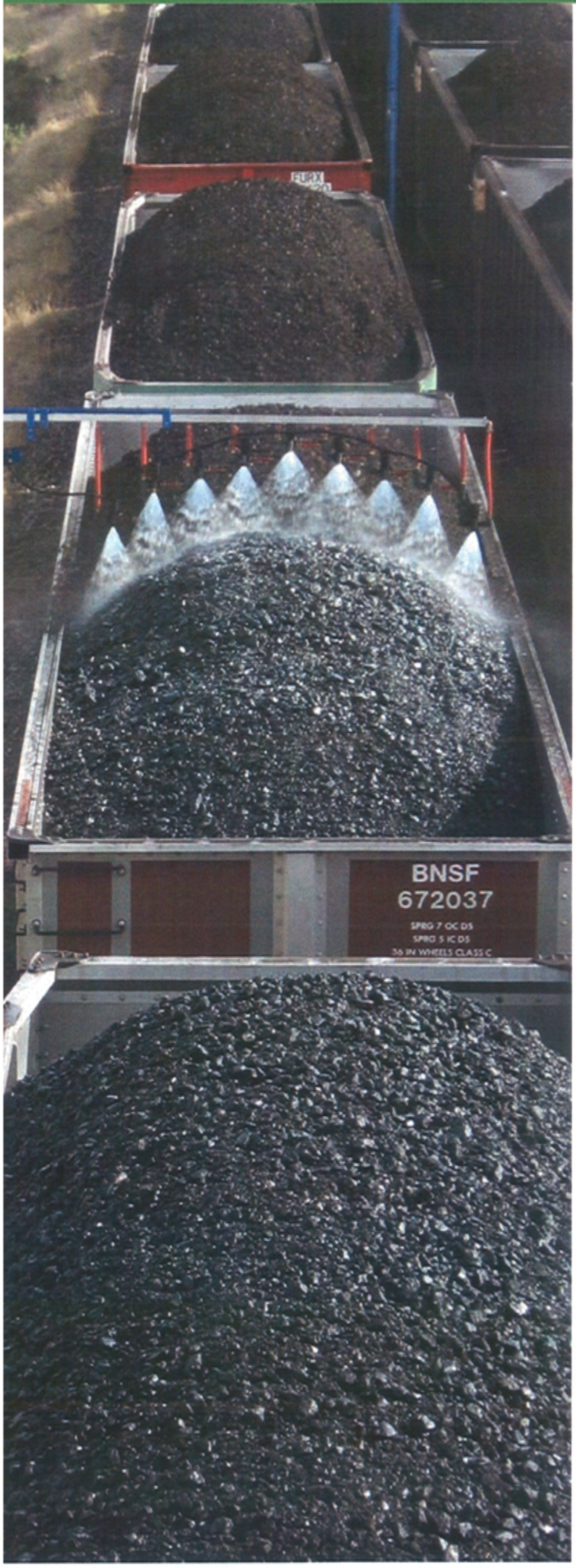
Du Pont (Australia) Ltd.
Level 3, 7 Eden Park Drive, Macquarie Park, NSW, 2113
Locked Bag 154, North Ryde BC, NSW, 1670

Free call: 1 800 252 997
Phone: 02 9923 6111
Fax: 02 9923 6011

www.dustsuppression.dupont.com
www.dupont.com.au

DUPONT *The miracles of science*™

Coal CarTopping
Dust Control for Coal in Transit



Eliminate Dust Reliably and Consistently Year Round

Where there is coal, there is dust, one of the biggest nuisances with which mines, railroads and utilities must cope – more so as changing environmental and railroad regulations are imposed. In the field and at industry events, we hear of the concerns railroad and coal mine management have about coal dust as a health hazard, as damaging to equipment and as an environmental hazard for which they will be held responsible.

If in-transit coal dust is a problem you face daily, it is a problem you don't have to face at all. Midwest can bring you a turnkey three-pronged solution, or any part of it you need: product that has proven its performance excellence, a customizable application system, and a local service network to ensure optimal system efficiency.

Midwest has proven it can deliver the control efficiency you need using less product for optimal results that cost less.

Used together, Midwest's Soil-Sement Engineered Formula® and application equipment will bring you the following benefits and more.

Vital statistics

- Penetrates into and seals coal surface to prevent coal dust from escaping
- Exhibits more strength than other polymers
- Does not crack or break up
- Protects coal from damaging external elements like wind, rain, snow, ice and ultraviolet rays
- Does not affect the BTU of coal and has no VOCs
- Reduces storage, shipping and product costs associated with higher-volume product use

MIDWEST

Making a difference since 1975

Midwest's service to the coal mining industry and its customers is as old as we are – 36 years. Witnessing our customers' need to reduce coal dust in the mining-to-delivery process, we pioneered our car topping program in 1994 and have been refining it to better control in-transit coal dust since then.

Soil-Sement Engineered Formula

Soil-Sement Engineered Formula delivers something its competitors cannot: peace of mind. It has proven to be the most reliable and consistent dust-control sealant for coal in transport, which is why Midwest is one of less than a handful of approved BNSF vendors.

Formulated with million-molecule nanotechnology to penetrate and seal coal to prevent dust from escaping, Soil-Sement has been tested and verified by Simpson Weather Associates Laboratory (for weatherability); BNSF (for corrosion, safety, and performance); and Southern Company (for burnability). It was also tested and certified by the California Air Resources Board, the US EPA, and the Canada Environmental Technology Verification programs.

Midwest's Coal CarTopping System®

Our year-round, containerized, operator-friendly system will make it easier to eliminate dust from your in-transit operations:

- Protects against freezing with a heated container
- Allows a clear view of coal cars from a heated, raised operator's booth
- Adjusts to match the profile of coal in a railcar
- Durable enough to spray 24/7, 365 days a year
- Installs permanently

"Safety First" is More Than an Adage

Your job is safe in our hands. Safety is a pillar of Midwest's culture. It affects the products we manufacture, the expectations we set, and the decisions we make both at Midwest and at customer sites. Wherever in the world our customers take us, we bring with us our own strong safety presence and fully participate in MSHA safety programs and procedures.

More reasons to choose Midwest

Midwest is the world leader in environmentally sound, dust-control technology for every application where fugitive dust is a problem. We bring our customers more solutions, documentation and support than any other manufacturer, striving always, to develop cutting-edge processes, products and services.

Midwest Industrial Supply, Inc.
1101 3rd Street Southeast
Canton, Ohio 44707
www.midwestind.com

Tel 330.456.3121
Fax 330.456.3247
Toll Free 1.800.321.0699

MIDWEST

EXHIBIT 3 PAGES 12-39
ARE HIGHLY CONFIDENTIAL

MinTopper™ S+0150

TOPPER-APPLIED DUST CONTROL, SURFACE STABILIZATION, AND EROSION PREVENTION

Description:

MinTopper S+0150 is an acrylic/vinyl emulsion specially formulated to provide optimum penetration and bonding when applied to fine or granular materials. Superior cohesion and elasticity are provided by the unique binding agents in MinTopper S+0150. MinTopper S+0150 provides a durable, water-resistant surface. Because it is formulated for use in and around sensitive habitats, MinTopper S+0150 is an environmentally sound solution for dust control and stabilization needs.

Benefits:

- Exhibits binding properties that provide extended dust suppression both downstream of the application point and during storage.
- Ultra concentrated formulation reduces freight impact.
- Typically provides 90 - 180 days residual dust suppression.
- Forms a firm, rubbery crust upon curing.
- Crust is heat stable and water resistant.
- Ideal for in-transit coal dust suppression application.
- Does not impact burn characteristics or fly ash composition.
- No adverse fireside problems.

Sites where MinTopper S+0150 has proven to be effective:

Coal Piles - Coal Rail Cars - Fly Ash Piles - Mine Operations
Soil Stabilization - Power Plants - Hydroseeding - Pond Slopes
Quarry Operations - Construction - Ore Stockpiles - Landfills
Steel Mills - Wineries - Agriculture - Port Facilities- Airports
Ore Stockpiles - Truck Terminals - Unimproved Roads
Logging Operations - Intermodal Rail Yards - and many more.

"Green Facts"

MinTech Enterprises EnviroPact

- Biodegradable - 100% readily biodegradable as per 40CFR796.3200
- Non-Flammable
- Non-Corrosive
- Neutral pH
- HMIS codes of 0 or 1
- Contains no toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right To Know Act of 1986 (40CFR372)
- No Phosphates
- No EDTA, APE or NPE compounds
- No Prop 65 ingredients
- No carcinogens or mutagens
- Does not contain any Mercury.
- Does not contain any of the following metals: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, or Zinc.
- Contains extremely low levels of VOCs: less than 0.02% as Styrene
- Practically non-toxic (EPA 821-R-02012)
  48-hour LC50 (Ceriodaphnia dubia): 3,151 mg/L
  96-hour LC50 (Pimephales promelas): 6,373 mg/L

Application:

Typical dilution rates are 1:10 - 1:40. Typical application rates are 15-30 gallons of diluted solution per 500 square feet (rail car) for topper application, 2000 - 6000 gallons per acre for static dust control applications, and 0.4 - 0.7 gallons per ton of coal for stackout applications. MinTopper S+0150 should be applied through dust suppression equipment to accurately measure product dilution and effectively control dust. Contact your local MinTech Enterprises representative for technical application guidelines and requirements. For more application information, please see the MinTopper S+0150 application procedures document.

Specifications:

pH @ 25°C (ASTM-E-70)	8.0
Density @ 25°C (ASTM-D-287)	1.015 g/mL or 8.47 #/gal
Color (visual)	White
Appearance @ 25°C (visual)	Opaque liquid
Foam Height	Medium
Odor	Slight, sweet odor
% Solids @ 140°C for 40 minutes	50-60%
Freeze Point	32°F (0°C)
Viscosity	180 cps @ 75°F | 230 cps @ 50°F | 260 cps @ 40°F
Temperature Stability (Neat Solution)	Freeze-thaw stable and heat stable up to 120°F
Storage and Handling	MinTopper S+0150 can be stored in plastic or metal containers. See label for details.Viton seals should be used in all pumps handling MinTopper S+0150 and pumps should be flushed out with water frequently to prevent buildup & damage to pump components.
Health/Flammability/Reactivity	1/0/0
Personal Protection	B-Safety glasses and gloves

MinTech® ENTERPRISES

MinTech® Enterprises
81 East Park Lane, Atlanta, GA 30309
Telephone: 404.234.5385 • Fax: 678-894-4204
www.mintechenterprises.com

EXHIBIT 3 PAGES 41-60
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EXHIBIT 3, PAGES 61-100
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EXHIBIT 4

EXHIBIT 4
IS CONFIDENTIAL

EXHIBIT 5

EXHIBIT 5
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EXHIBIT 6

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EXHIBIT 11

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EXHIBIT 12

Summary of BNSF/UP Super Trial 2010

Over a seven-month period from March – September 2010, BNSF Railway Company (BNSF) and Union Pacific Railroad Company (UP) facilitated a field evaluation of coal dust suppressants in the Powder River Basin. The purpose of this "Super Trial" was to develop and provide to coal shippers information on coal dust suppression technologies that the shippers can use to implement effective coal dust curtailment measures.

Super Trial Procedures

The Super Trial tested the effectiveness of seven different chemical agents in suppressing coal dust emissions from loaded trains. Four of the chemical agents were used in a "body treatment," where the chemical was applied to the coal before the coal was loaded into the railcars. Five of the chemical agents were used in a "topical treatment," where the chemical was applied to the coal after the coal was loaded into railcars. Two of the chemical agents were tested both in a body treatment and a topical treatment. The concentration and application rates for each chemical agent were established by the individual chemical vendors. Most of the vendors whose products were tested were selected by coal shippers and their mines. Attachment 1 to this Summary identifies the seven chemical agents tested in the Super Trial.

Altogether, 1,633 trains were treated with a coal dust suppression agent in either a body treatment or a topical treatment during the Super Trial. Each of these trains was tested under real world operating conditions to determine the effectiveness of the treatment agent in suppressing coal dust emissions. The treatments were applied on participating coal shippers' trains loaded at six Wyoming coal mines.

Of these 1,633 trains, 115 trains were tested using Passive Dust Collectors and portable weather stations. Attachment 2 shows the equipment used to conduct these tests. On each of these 115 trains, half of the cars were treated with a coal dust suppression agent and the other half were left untreated. Passive Dust Collectors were attached to the rear sill of seven treated and seven untreated cars on each train. The coal dust collected from the Passive Dust Collectors during the train's movement was then analyzed to compare the amount of coal dust emitted from the treated and untreated cars.

The remaining 1,518 trains were treated with a coal dust suppression agent in either a body treatment or a topical treatment and monitored at TrackSide Monitors located at Milepost 90.7 (on the Orin Line) and Milepost 558.2 (on the Black Hills Subdivision). Attachment 3 contains a photograph of a TrackSide Monitor. An electronic dust monitor mounted on the TrackSide Monitor measures the amount of coal dust emitted while the train passes the dust monitor and an Integrated Dust Value (IDV.2) is determined for the train. In some cases, such as where two trains passed the TrackSide Monitor at the same time, the IDV.2 data were excluded from the study because the coal dust measured by the TrackSide Monitor could not be reliably associated with a test train.

Super Trial Results

At the beginning of the Super Trial, tests were carried out using two of the chemical agents to determine whether there was a correlation between coal dust measured by the TrackSide Monitors and coal dust measured by the Passive Dust Collectors. These tests showed that the results of both monitoring approaches were correlated. This correlation is confirmed by the overall results of the Trackside Monitor and Passive Dust Collector tests.

The results of the TrackSide Monitor tests showed that that the use of a topical treatment substantially reduces the amount of coal dust emitted from a loaded coal car. As shown in Attachment 4, 90 percent of the trains that received a topical treatment had IDV.2 readings at Milepost 90.7 below 91. (BNSF's IDV.2 coal dust standard for Milepost 90.7 is 300.) The corresponding IDV.2 value for untreated trains was 332, more than three times higher. For the trains monitored at Milepost 558.2, more than 90 percent of the trains that received a topical treatment had no measurable IDV.2 value at all. At both Milepost 90.7 and 558.2, the number of trains showing any measurable amount of coal dust emissions dropped significantly when a topical treatment was applied to the train. Trains that received a body treatment showed only a limited reduction in coal dust emissions.

The results of the Passive Dust Collector tests on the 115 tested trains confirmed that the use of a topical treatment substantially reduces coal dust emissions. Attachment 5 shows the percentage reduction of coal dust for each tested chemical agent. As shown in Attachment 5, there is significant variation in the effectiveness of different topical treatments. The coal dust reductions ranged from 75 to 93 percent depending on the topical treatment used in the test. Three topical treatment agents showed coal dust reductions of 85 percent or more -- AKJ CTS-100, Midwest Soil-Sement and Nalco Dustbind Plus. As shown in Attachment 5, the Passive Dust Collector tests also showed that there was no statistically significant reduction in coal dust emissions in trains that received a body treatment.

Finally, during the course of the Super Trial, field audits of treated trains showed that there was at times significant variation in the quality and consistency of the physical application of topical treatments at the mines. This was not surprising due to the fact that the application procedures were being done on a test basis with temporary facilities. However, the quality of application of the topical treatment could make a significant difference in the effectiveness of the application in suppressing coal dust emissions. In addition, audits of the load profile show that proper load profiling is not being consistently achieved at the mines. Effective coal dust reduction will require that careful attention be given to controlling the quality of the application process and the load profiling when coal dust suppression measures are implemented.

An additional phase of the Super Trial is planned to commence in early 2011 to test a railcar compaction and shaping prototype. The prototype is designed to apply physical forces to a loaded railcar to drive coal fines away from the open top of a railcar, displacing coal dust particles from the upper profile of a loaded car, which is most vulnerable to winds during transport. Final results from this portion of the Super Trial are expected to be available in mid-2011.

ATTACHMENT 1

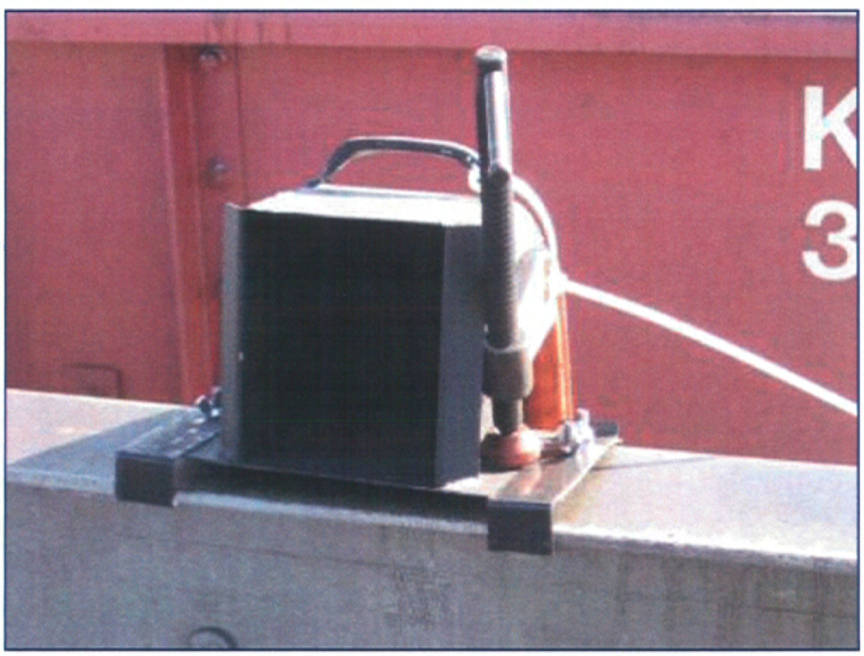
Dust Suppressants Used During Super Trial

Test Period	Body Treatment	Topical Treatment
March – May 2010	GE DC-9144	Rantec Capture 3000L
June 2010	Freedom CTS-1000	Midwest SoilSement
July 2010	Benetech BT-553	AKJ CTS-100
August 2010	Nalco DustBind Plus	Freedom CTS-1000
September 2010	N/A	Nalco DustBind Plus

ATTACHMENT 2

Equipment Used to Determine the Effectiveness of In-Transit Dust Suppressants

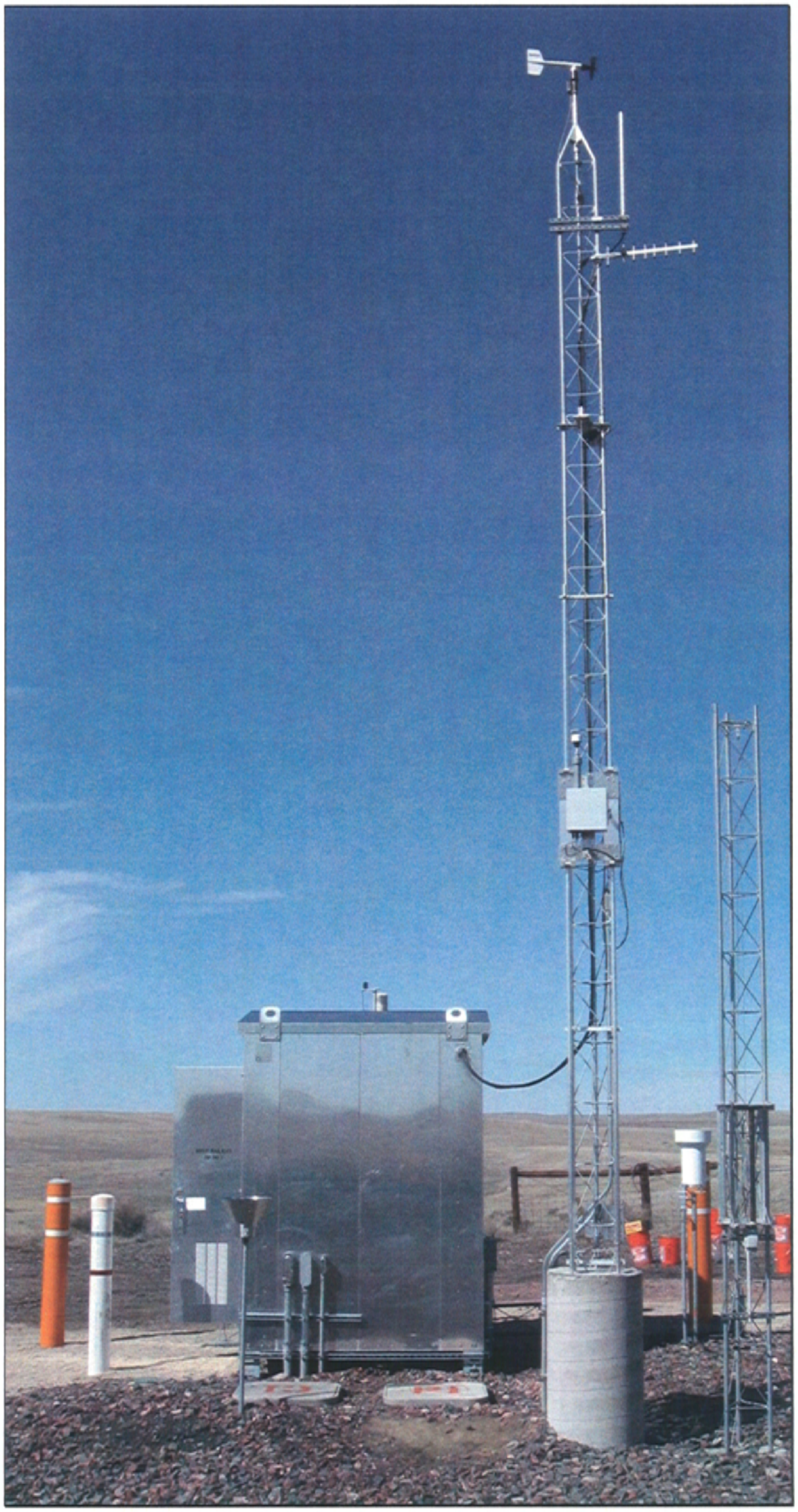
Rail Transport Emission Profiling System (RTEPS)



Passive Collector

ATTACHMENT 3

TrackSide Monitoring System



TrackSide Monitor (TSM) weather/aerosol monitoring station. The TSM includes a real-time aerosol monitor anemometer, temperature/relative humidity sensor, and rain gage.

ATTACHMENT 4

TrackSide Monitor Results of Dust Suppressants Used During Super Trial (March - September 2010)

Topical Treatment

	MP 90.7		MP 558.2	
	Treated Trains	Untreated Trains from Topper-Treating Mines	Treated Trains	Untreated Trains from Topper-Treating Mines
Number of Usable Trains:	249	1466	230	700
90% of trains have IDV.2 values below this level:	91	332	0	74
Percentage of trains with measurable dusting events:	24.9	39.4	7.0	23.3

Body Treatment

	MP 90.7		MP 558.2	
	Treated Trains	Untreated Trains From Body-Treating Mines	Treated Trains	Untreated Trains From Body-Treating Mines
Number of Usable Trains:	243	1827	20	142
90% of trains have IDV.2 values below this level:	136	223	93	183
Percentage of trains with measurable dusting events:	25.5	32.8	20.0	26.8

ATTACHMENT 5

Passive Collector Results of Coal Dust Suppressants

Topical Treatment	Topical Treatment Dust Reduction
Rantec Capture 3000L	73%
Midwest SoilSement	92%
AKJ CTS-100	85%
Freedom CTS-1000	75%
Nalco DustBind Plus	93%

Body Treatment	Body Treatment Dust Reduction
GE/Crown DC-9144	No Statistical Difference From Untreated
Freedom CTS-1000	No Statistical Difference From Untreated
Benetech BT-553	No Statistical Difference From Untreated
Nalco DustBind Plus	No Statistical Difference From Untreated

EXHIBIT 13

EXHIBIT 13
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EXHIBIT 14

EXHIBIT 14
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EXHIBIT 15

EXHIBIT 15 PAGE 1
IS HIGHLY CONFIDENTIAL

Alpha Coal Sales Co., LLC

Bruce A. Taylor
Vice President - Sales

September 12, 2011

Mr. Ernie Parra
Omaha Public Power District
444 South 16th Street Mall
Omaha, NE 68102-2247

Re: Dust Suppression

Dear Ernie:

The purpose of this letter is to inform you that Alpha Coal West has chosen AKJ Industries, Inc. as the vendor for installation and operation of railcar topper spray systems for dust control at both the Eagle Butte and Belle Ayr mines.

Alpha's agreement with AKJ is expected to be in place through the end of 2012 during which time the cost to Alpha Coal West's customers for the topper agent will be approximately $0.15/ton. This figure includes the cost of the AKJ CTS-100 product and the relevant federal royalties. An MSDS for the AKJ product is attached for your reference.

BNSF and UP railroads have been notified of Alpha's selection of AKJ and our intent to have the topper systems in place by October 1, 2011 or as soon as practicable thereafter. AKJ has indicated an approximate lead time of 30 days on the necessary equipment and infrastructure.

Thank you for your patience as we work through this process. If you have any questions, please contact me at 303.749.8434.

Kind Regards,

Bruce

Bruce A. Taylor
Vice President - Sales

Enclosure

an affiliate of **Alpha** Natural Resources

391 Inverness Parkway
Suite 333
Englewood, Colorado 80112

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btaylor@alphanr.com
www.alphanr.com

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BORO, RONALD T

From:	Brown, Kathy <KBrown@archcoal.com>
Sent:	Tuesday, October 18, 2011 2:44 PM
To:	Brown, Kathy
Cc:	Baumberger, Billy; Vigil, Carlyn; Hensala, Greg; Thiedke, Bill; Smith, Kent; Barber, Paul; Smith, Rowdy; Poettker, Bryan; Arnold, Shaun; Canon, Mark; Warner, Paul; Ritter, John; Schroeder, Tim
Subject:	Arch Coal 2011-2012 Coal Additive Pricing
Attachments:	MSDS - DUSTREAT - DC9144.pdf; Dustreat 6109.pdf; DUSTREATDC9148.pdf; FC-1200MG-P BTM_MSDS.PDF; MSDS - Soda Ash.pdf; 2011-2012 Coal Additive Pricing.xls; soil sement coal car topper 2225 08032009.pdf; Soil-Sement ABC AQ TOX Short.pdf

Please see the attached Excel spreadsheet for updated pricing and availability for dust suppression, dust topper, fire retardant, side release, and soda ash. Items to note are:

Prices are the same as last season – with the exception of dust topper.
Midwest Soil Sement is the topper chemical and priced at $21 per car sprayed.
MSDS's associated with the various treatments are attached.

Please let us know if you would like to have your trains sprayed with side release for freeze conditioning purposes. Please let us know your desired start and end dates. If possible, please give us a few days notice so we can be sure to get your requests in the loading instructions.

If you have any questions or would like more information about the various treatments, please feel free to contact me.

Best Regards,
Kathy

Kathy Brown
Manager, Transportation and Technical Services
Arch Coal Sales, Inc.
314-994-2735
314-698-9699 mobile
kbrown@archcoal.com

VERIFIED STATEMENT OF
E. DANIEL CARRÉ AND MARK MURPHY

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35557

REASONABLENESS OF BNSF RAILWAY COMPANY
COAL DUST MITIGATION TARIFF PROVISIONS

VERIFIED STATEMENT OF E. DANIEL CARRÉ AND MARK MURPHY

We are E. Daniel Carré and Mark Murphy. Mr. Carré is the Assistant Director – Environment & Energy Division at Simpson Weather Associates ("SWA"). Mr. Murphy is the Vice President/Principal at Conestoga-Rovers & Associates ("CRA"). Our curricula vitae are attached as Exhibits 1 and 2.

Mr. Carré received a B.S. in Meteorology from Millersville University, Millersville, Pennsylvania, and a M.S. in Environmental Sciences from the University of Virginia, Charlottesville, Virginia. I began studying coal dust in 2005 in consulting work that SWA did for Norfolk Southern, and I have studied coal dust for BNSF Railway Company ("BNSF") since 2005. I have had broad responsibility for the laboratory and field evaluation of stockpile and in-transit coal dust suppressant methodologies in the Eastern United States and in the Powder River Basin ("PRB") for more than seven years. In that work, I have had extensive interaction with railroads, mines, shippers, and chemical vendors on the issues of coal dust and on ways to substantially reduce fugitive coal dust from loaded trains in transit. My primary responsibilities have included data collection of in-transit coal dust, right-of-way coal dust deposition monitoring and data analysis, reporting to the mines, railroads, and shippers, and review and implementation of dust mitigation techniques in the PRB.

Mr. Murphy has a B.S. in Physical Geography, from Salem State University, Salem Massachusetts, and received a MBA from Jacksonville University, Jacksonville, Florida. I have worked on matters involving railroad operations and infrastructure for more than 30 years. Since 2005, I have managed the Emergency Response Air Modeling, Toxicology and Industrial Hygiene Service groups for CRA as well as Railroad Service Sector Practice group. I have studied in-transit and fixed location coal dust issues for more than fifteen years, as well as other fugitive dust related issues. I have worked with BNSF in the PRB on coal dust issues for nine years, including work on the design and construction of grooming bars for loading coal and other projects relating to in-transit coal dust, work relating to coal dust accumulation, engineering and maintenance-of-way concerns, in-field implementation of research methods, data collection, data analysis, and development of protocols to monitor groomed profiles of loaded cars.

The purpose of our verified statement is to explain to the Board that the measures shippers and their mine agents must take under the safe harbor provision in BNSF's Coal Loading Rule are straightforward, uncomplicated, and effective at reducing coal dust losses in transit.[1] There is abundant evidence that the use of topper agents applied to well-groomed coal loads can eliminate most coal dust losses from coal trains in transit. In other areas of the United States and the world where in-transit coal dust has been identified as a problem, coal shippers and mines have adopted largely the same approach to mitigating coal dust losses as the approach set out in BNSF's safe harbor. Indeed, we are not aware of any other commercially feasible approach to dealing with coal dust in transit that is currently available for use in the PRB.

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[1] BNSF's Coal Loading Rule is contained as Exhibit 1 to BNSF's Counsel Argument.

I. BNSF's Safe Harbor Provisions Set Out Straightforward and Uncomplicated Measures For Dealing With Coal Dust In Transit.

The safe harbor provisions in BNSF's Coal Loading Rule set out a two-pronged approach to loading coal so that coal dust will not escape during transit. Under the safe harbor, a shipper will be deemed in compliance with BNSF's Coal Loading Rule if the shipper or its mine agent (1) grooms the loaded coal during the loading process so that the loaded coal conforms to a specified aerodynamic profile; and (2) applies one of five approved topper agents to the loaded coal.[2] Both approaches can be implemented without substantial change to existing loading practices at PRB mines. Indeed, all of the PRB mines are equipped to provide load profile grooming, and most PRB mines have installed equipment for applying topper agents to the loaded cars.

We explain below the measures that need to be taken to comply with the safe harbor provisions. This discussion is based on our extensive experience working since 2005 with PRB shippers and mines to assist them in implementing coal loading practices that will keep the loaded coal in the railcars.

Load Profiling

BNSF's safe harbor requires a shipper or its mine agent to groom the loaded coal according to a specified aerodynamic profile that is shaped like a breadloaf. The required profile is set out in Appendix A to BNSF's Coal Loading Rule. By grooming loaded coal to the specified profile, the impact of wind and air currents on the coal during transit can be reduced. Exhibit 3 compares the load profile of a groomed and ungroomed coal car. The rough edges and uneven slope of the coal load in an ungroomed car create air currents that can blow small coal

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[2] One of the topper agents is approved for use in two forms, concentrate to be mixed with water at the mine and pre-mixed with water.

particles out of the car. A groomed load profile makes the coal more stable and less likely to blow off the top of the car during the trip since the coal is already closer to its preferred and natural angle of repose for PRB coal.

SWA became familiar with the use of grooming coal loads to reduce coal dust losses in transit from its work with Norfolk Southern beginning in the late 1980s in dealing with coal dust issues on Norfolk Southern's network in West Virginia and Virginia. In the course of that work, SWA developed a load profile that would reduce the effect of wind on the coal based on the characteristics of the Eastern coal being transported by Norfolk Southern. Different types of coal have different physical properties that need to be taken into account in developing an aerodynamic load profile for a particular type of coal. When SWA began advising BNSF on PRB coal dust issues after the derailments of 2005, we knew that proper grooming of the coal load could reduce coal dust losses, and we carried out studies to identify a proper load profile for PRB coal. Our testing determined that the optimum shape for the sub-bituminous coal found in the PRB was to have the coal lie at an approximate 30 degree angle in a breadloaf shape. This shape approximates the natural angle of repose of the coal, which is the slope that the coal would take from the effect of vibration and wind during a train's movement.

Once we had identified the proper profile for loaded PRB coal cars, we began working with the PRB mines to develop the equipment and operating practices that would allow the mines to create a breadloaf profile of the loaded coal when they loaded the cars. We found that the existing loading chutes made it very difficult to load coal to the specified profile. Therefore, we worked extensively with each PRB mine to design a loading chute that would produce properly groomed loads. Exhibit 4 shows pictures of a redesigned loading chute capable of grooming the loaded coal compared to an old chute. The older loading chutes produced a coal profile that had steep angles and irregular surfaces. We also responded to concerns raised by members of the National Coal Transportation Association ("NCTA") that modifying the load profile would reduce the amount of coal that could be loaded or would increase the time to load a train by showing that the redesigned load-out chutes would not limit the amount of coal able to be loaded into the car. Our understanding is that each PRB mine is using a modified loading chute that largely conforms to the design that we developed.

The mine load-out operator plays an important part in the proper grooming of a loaded coal car, even when a modified loading chute is used. We have found that operator training and experience have a significant impact on the quality of the load profile grooming. Therefore, we have also spent a large amount of time in the last few years on behalf of BNSF working directly with the PRB mines to help them implement appropriate procedures in the loading process for the most effective use of the modified loading equipment. We traveled to the PRB every month from December 2009 through October 2011 to carry out visual inspections of loaded coal trains. During each trip, we spent three to four days in the PRB and observed loaded trains in transit on the Joint Line and Black Hills Subdivision. On those trips, we met frequently with the mines and shared our findings and recommendations regarding loading practices with them. We also shared pictures, videos, and laser data with mines and shippers to provide feedback regarding the profiles of loaded cars.

The mines have told us that they have found our input very helpful in improving their loading practices, and they have incorporated our feedback to improve their loading practices. BNSF therefore asked us to expand our efforts in this area and to establish permanent facilities that will provide detailed and timely feedback on loading practices. We are now in the process of replacing our monthly visual assessments of load profiles with an automated system called the

Coal Car Load Profile System ("CCLPS"), which was developed by SWA. CCLPS uses a scanning laser mounted above the track that produces a 3-D image of the surface of every coal car in a loaded train that passes the laser. *See* Exhibit 5 (comparing CCLPS images of properly and poorly loaded cars). CCLPS also produces detailed data on the profile of the coal load that can be used by the mines to assess and refine their loading practices.

Application of Topper Agents

The second prong of BNSF's safe harbor approach involves the application of topper agents to the top of the profiled coal. The topper agents are specially-formulated chemicals that are mixed with water and sprayed onto the top of the loaded coal. They are designed to form a thin crust or film that fills voids in the surface of the coal and holds together the surface of the coal to prevent erosion by wind as the train is in transit. We have attached as Exhibit 6 to this statement a couple of photographs showing a crust that is formed by the application of a topper to the loaded coal.

The topper chemicals are not harmful to handle and are non-hazardous to field personnel. There are several chemical producers, including companies that specialize in dust control, that have produced topper agents that are specially formulated for use on loaded coal cars to suppress in-transit dust. We understand from discussions with mines and chemical suppliers that the toppers do not affect boiler operations or the amount of heat generated by the coal at the coal shippers' facilities. Thirteen mines in the PRB owned by { } have begun to apply topper agents to loaded coal cars when instructed to do so by the mine's customers. This includes all of the large PRB mines. Some of the mines, { } have been treating trains since November 2009.

The application of the toppers to the loaded coal cars is very straightforward. The different types of spray systems in use are variations on a basic horizontal spray bar with overlapping nozzles that ensure complete coverage of the top of the loaded coal. The loaded coal is sprayed as the railcar passes directly under the spray mechanism at a speed of approximately 0.25 to 1.0 mile per hour. Some spray facilities are automated with electric eyes to shut the spray off between cars, and most spraying systems have wind shields. The spray mechanism can generally be operated by a single technician, or by the mine load-out operator. Attached to this statement as Exhibit 7 are pictures of coal in railcars being sprayed and video clips of an automated spray mechanism.

As is clear from the prior exhibits, the infrastructure needed to apply toppers is not highly sophisticated. In addition to the spraying mechanism, which we described above, the spray facility includes pumps, tanks storing the topper, and main lines. Most PRB mines have installed temporary spray facilities that can be used year round, and they are in the process of installing permanent facilities. During the last six months, we have seen substantial improvement in the spray systems at mines in the PRB, including the addition of windscreens, improvements to the spray bar and nozzles, and better shaping of the spray bar.

With the proper equipment, application of the toppers is largely automated and does not require sophisticated training or broad experience by the load out operators. Nevertheless, in our visits to the PRB mines to assist in load profile training, we have observed occasional problems with topper application, such as inconsistent application of the topper agent to the loaded coal or clogged spray nozzles. These issues can easily be addressed through proper use of the topper agents and spray equipment and maintenance. Where we have observed such an issue, we have brought the issue to the attention of the mine so that it can be corrected.

BNSF's Safe Harbor Permits Shippers To Seek Inclusion Of Other Methods Of Coal Dust Suppression.

Finally, it is worth noting that Paragraph 4 BNSF's Coal Loading Rule permits a shipper to seek inclusion of other methods of coal dust suppression if the shipper demonstrates that the method reduces in-transit coal dust losses by at least 85%. *See* Counsel Exhibit 1 ¶ 4.

Paragraph 4 has been successfully used by shippers and mines to add two topper agents to BNSF's approved list – Rantec Capture 3000 and MinTech Min Topper S+1050. Shippers and mines sponsored tests of these two topper agents in August through September 2011, using the same basic field test methodology as that used in the extensive field tests carried out in 2010 in the so-called Super Trial, which is discussed below. The results demonstrated that both topper agents were effective in reducing in-transit coal dust losses. BNSF added these topper agents to the list of acceptable topper agents in its safe harbor provision.

We continue to work with shippers and mines to test additional methods of coal dust suppression. In summer 2012, {

} We also expect to assist in the evaluation of other dust mitigation approaches in the future, including tests of different topper agents and different application and concentration levels.

II. The Approach Set Out In The Safe Harbor Is Effective in Limiting Coal Dust Losses In Transit.

There is abundant evidence from multiple sources that the application of topper agents, particularly when combined with proper grooming of the loaded coal, can substantially reduce coal dust losses in transit. We summarize that evidence here.

Technical Literature and Other Studies

Technical literature and other studies leave no doubt that the application of chemical toppers or binding agents to the top of a loaded coal car can effectively prevent most coal dust from escaping the car during transit. Studies dating as far back as the 1970s have concluded that the use of chemical binders or topper agents are effective dust mitigation measures: "When coal is treated with a binder, losses are insignificant even at very high velocities . . . . The use of a chemical crusting agent has been the most practical and successful approach to greatly reducing wind erosion of in-transit or stockpiled particulates." K.H. Nimerick and G.P. Laflin, *In-Transit Wind Erosion Losses of Coal and Method of Control*, *Mining Engineering*, Vol. 31 No. 8, 1236-1240 (Aug. 1979).[3]

Numerous other studies have reached the same conclusion. An engineering consulting firm in Australia studied two chemical dust suppressants (also known as "veneers") to minimize in-transit coal dust losses. The firm concluded that the chemical dust suppressants substantially reduced in-transit dust losses. "When both tested chemical surface veneer options were applied to the coal surface, dust liftoff was reduced to nil." Katestone Environmental Pty. Ltd., *Duralie Extension Project, Study of Dust Emissions from Rail Transport,* at 18 (Feb. 2012).

Other Australian consultants have reached similar conclusions: "[Chemical] veneering is practical and cost-effective mitigation strategy to reduce coal dust emissions from the top of loaded coal wagons during transport." Connell Hatch, *Generic Veneering System Proposal, Environmental Evaluation, Queensland Rail Limited, Appendix F*, at 13 (Mar. 31, 2008). *See also* Connell Hatch, *Barney Point Coal Terminal Dust Benchmarking Study, Gladstone Port*

[3] For the convenience of the Board, copies of the studies cited herein are included on the CD attached to BNSF's Opening Evidence and Argument.

Coal Dust Study, Gladstone Ports Corporation (July 14, 2008) ("The veneer treatment resulted in nil dust lift-off from all nine coal types."). As a recent study concluded,

> "Test programs have also been conducted to demonstrate a high level of effectiveness of chemical veneer treatment on the surface of coal transported in open rail wagons. From the test results . . . it is evidenced that the coal samples veneered with the dust suppressant agent type 1 (DS-1) have the ability to significantly control fugitive coal's dust. This is largely achieved due to the dust suppressant agent type 1 (DS-1) and its ability to produce a stable surface crust created on the top of the wagon coal surface which acted like a wind shield deflector."

M. Djukic & J.H. Planner, *Reducing Coal Dust Emission from Wagons, Bulk Solids Handling* (Apr. 4, 2011). DuPont field tested its dust suppression agent in Australia and found a high level of reduction of in-transit dust losses. "[T]he results as the train passed through the corridor indicated that the dust emissions from the treated section of the train were 85% less than from the untreated section of the train." Paul Hayes, *The Right Agent for the Right Case, Australian Mining* (May 2009).

Researchers in Canada conducting a wind tunnel study of coal losses in transit also concluded that binding agents are effective: "The results clearly show how effective crusting agents can be at reducing the fugitive dust losses from coal and the results showed that proper crusting agents can significantly reduce the dust emissions as compared to railed coal alone. This certainly confirms the effectiveness of this type of coal unit train dust control procedure which is currently being applied at the mines in Western Canada." R. Leeder, W. Hunty, & J. Price, *Train Transportation Coal Losses – A Wind Tunnel Study*, Iron and Steel Technology Conference, AISTech 2007 Proceedings Volume I, at 134 (2007). Earlier field studies in Canada in 1977 showed that "some chemical binders offered an immediate and satisfactory solution to controlling coal dust emanation from en route unit trains." Claudio Guarnaschelli, *In-Transit*

Control of Coal Dust From Unit Trains, Environmental Protection Service: Fisheries and Environment Canada, Report No. EPS 4-PR-77-1, at 1 (May 1977).

In addition to the studies above, which looked at the effectiveness of chemical toppers or binding agents to prevent in-transit dust losses, other studies have found that chemical agents are effective in curtailing coal dust losses at the mine. For example, a study performed for a mine in Alaska has concluded that chemical suppressants were effective in substantially reducing coal dust. The study found that chemical suppressants were a "proven alternative for dust control" and that "chemical dust suppressants have a successful record in eliminating visible dust emissions generated from processing western coal." Jerry Fillingim & Mark Wajer, *Usibelli Tames Low-Rank Coal Dust, Coal Magazine*, Vol. 96, 41-43 (Nov. 1991). The study concluded that "[d]ust-suppression results of greater than 90% are routinely obtained" at the mine. *Id.*

Experience Outside the PRB

Given the evidence in technical literature and other studies on the effectiveness of toppers, it is no surprise that in every coal producing region outside the PRB where efforts have been undertaken to control coal dust in transit, the application of topper agents, often combined with coal profile grooming, has been the approach used. Indeed, the experience in these other regions shows that the approach set out in BNSF's safe harbor is simple and effective.

As discussed above, studies were done as early as the 1970s in Canada on the effectiveness of topper agents to control coal dust losses in transit. The studies found that a number of encrusting agents were effective in controlling coal dust losses in transit. Claudio Guarnaschelli, *In-Transit Control of Coal Dust From Unit Trains, Environmental Protection Service: Fisheries and Environment Canada*, Report No. EPS 4-PR-77-1 (May 1977). Based on these studies, officials in Canada responded in the 1980s to coal dust concerns by recommending that coal trains should be sprayed with an encrusting agent to control in-transit coal losses. *Coal Dust Control, Recommended Practices for Loading, Unloading and Transporting Coal by Rail*, Environment Canada at 11, 15, 21 (1986). Major mining companies in Canada agreed to comply with these recommended practices. *Id.* There is now a longstanding practice of applying toppers to loaded coal cars in Canada.

There is also a long history of the use of topper agents applied to groomed coal cars in the eastern United States. Norfolk Southern has been using a combination of load profile grooming and application of toppers since the 1990s to address concerns about coal dust in Virginia. In 1997, a subcommittee of the Virginia General Assembly concluded that spraying topper agents and grooming coal in rail cars was effective, stating that "the most successful mitigation technique appears to entail modifying the load profile of coal cars followed by application of a chemical binder." *Report of the Joint Subcomm. Studying Ways to Reduce Emissions from Coal-Carrying Railroad Cars*, Senate Doc No. 23 (1997). The Virginia Senate expressly found in 1997 that profiling and spraying a chemical binder "have significantly reduced the amount of coal dust blown from moving trains." Senate Joint Res. No. 257 (Feb. 13, 1997). Norfolk Southern has regularly monitored the effectiveness of its coal dust mitigation efforts and submits annual reports to the Virginia joint subcommittee formed to study in-transit coal dust. Norfolk Southern's reports show that the measures taken by its mines have effectively dealt with in-transit coal dust losses.

CSX also has experience with dust suppressants applied to loaded coal to address concerns in Kentucky about coal dust losses in transit. A recent press release from CSX reminded its "Coal Producing community of the need to be proactive and apply sufficient dust suppressant to all loaded rail cars, not only during this extremely dry season, but throughout the year as required." CSX Press Release, *Rail Car Dust Suppressant Reminder* (Sept. 1, 2010).

In Australia, there is also a long history of efforts to control coal dust in transit. QR National Network ("QR") implemented after lengthy study a program for dealing with in-transit coal dust that is very similar to the approach set out in BNSF's safe harbor provisions. QR's Coal Dust Management Plan involves the application of a topper chemical (referred to as a "veneer") to a groomed "garden-bed" coal load profile with a 37 degree angle of repose. QR Network, *Coal Dust Management Plan* (Feb. 22, 2010). QR's plan has been approved by the Department of Environment and Resource Management.

Based on conversations we have had with QR, we understand that as of June 2012, {

} Exhibit 8, QR National, *Coal Loss Management Program: Veneering and Monitoring* at 5 (June 2012).

Other coal producing regions in the world have recognized the need to deal with coal dust escaping from loaded coal trains in transit and are using topper agents to address the problem. BNSF explained in *Coal Dust I* that the Shenhua Group in China started applying topper agents to loaded cars after concluding that the cost of the topper agents was less than the cost of coal lost in transit. It is our understanding that the Cerrejon Coal Mine in Colombia has begun spraying a topper agent to loaded coal cars to reduce coal dust in transit.

BNSF's PRB Studies

BNSF's own studies confirmed the effectiveness of topper agents applied to groomed coal in reducing coal dust losses from trains in transit. We do not repeat here the evidence submitted in *Coal Dust I* on BNSF's efforts to study coal dust after the derailments of 2005.

Mr. VanHook explained in *Coal Dust I* that BNSF's initial field tests of topper agents in 2005 and 2006 showed that topper agents applied to groomed coal cars can achieve substantial reductions in coal dust losses in transit as compared to the non-treated sections of the train. The average dust reduction exceeded { } in BNSF's September 2005 and November 2005 field tests. Field tests carried out in April and August 2006 similarly demonstrated that topper agents are effective in reducing in-transit dust losses, achieving reductions ranging from approximately { } *See Coal Dust I*, VanHook Op. VS Ex. 5 at 48-52.

In a statement that is being submitted in this proceeding, Mr. VanHook explains that BNSF, with our assistance, undertook extensive additional field and laboratory studies in 2010 of several topper agents in the so-called Super Trial. As Mr. VanHook explains, the Super Trial passive collector tests, where dust collection equipment was attached directly to several cars on numerous test trains, showed that three topper agents that are commercially available reduce coal dust losses by at least 85%. As discussed above, subsequent tests identified two more topper agents that reduce coal dust losses by at least 85%.

In addition to the passive collector tests that were the focus of the Super Trial, we also collected data from the TrackSide Monitors that have been installed on the Joint Line and Black Hills Subdivision in the PRB. The TrackSide Monitors were described in detail in *Coal Dust I*, and we will not repeat that discussion here. In short, the TrackSide Monitors are towers constructed approximately sixty feet to the side of the rail line on which are mounted sophisticated optical aerosol monitors, the Met One Instruments E-Sampler, that measure the amount of dust in the air when a train passes the tower. The TrackSide Monitors also include weather measuring and train detection instrumentation.

The Board in *Coal Dust I* expressed concern about the use of the TrackSide Monitors to determine whether a shipper is in compliance with BNSF's coal loading requirements. To address that concern, BNSF's safe harbor approach does not rely on TrackSide Monitors, and BNSF did not use TrackSide Monitors to identify toppers to be approved in the safe harbor. Nevertheless, the data collected during the Super Trial from the TrackSide Monitors provide diagnostic tools and further confirmation of the effectiveness of topper agents to reduce coal dust losses. TrackSide Monitor readings were taken from more than 1,000 trains during the Super Trial. On the Black Hills Subdivision, { } of the treated trains had no measurable level of dust. On the Joint Line, the Integrated Dust Value ("IDV.2") level for the 90th percentile of trains (i.e., 90% of the measured trains had IDV.2 readings below this level) was about 73% lower for treated trains than for untreated trains. *See* VanHook Op. Exhibit 12 at 7.

<u>Shippers' Studies</u>

Finally, PRB coal shippers have done their own studies of the effectiveness of topper agents and those studies have confirmed BNSF's evidence and the evidence from other coal producing regions that toppers can effectively reduce coal dust losses in transit. In 2008, BNSF asked us to assist NCTA and Peabody, a coal producer that owns three PRB mines, in carrying out field tests of ten topper agents. Those tests used the same basic methodology used in the Super Trial. Of the ten topper agents tested, six showed a large reduction in coal dust losses in transit, and { } *See* VanHook Op. VS, Exhibit 5 at 5.

In 2008, the NCTA also sponsored a series of "static" or stationary tests that were carried out by NCTA's consultant Dr. Viz of Exponent, who has appeared in this proceeding on behalf of WCTL. The Exponent tests were performed in the field with giant fans used to simulate wind conditions over a stationary rail car. *See* Exhibit 9 at 1 (pictures of Exponent's static testing from Exponent's report to NCTA). We have some concerns about the way the static tests were conducted, which we do not need to discuss here. It is enough to note that Dr. Viz described the static tests as a { } Exponent Inc., *Railcar Coal Loss and Suppressant Effectiveness Study: Final Report to the National Coal Transportation Association* at xiii ("Exponent Report").[4] { } Exhibit 9 at 3-4. Indeed, the results from the passive collectors in Dr. Viz's static tests demonstrated that { } Exhibit 10 at 1-2 (summarizing passive collector results).

As a result of these tests, Dr. Viz concluded that { } Exponent Report at 162. He further concluded { } Exponent Report at Executive Summary, page xiv.

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[4] The Exponent Report is on the CD attached herein to BNSF's Opening Evidence and Argument. The report was included on the CD filed with BNSF's Reply Evidence and Argument in the materials in the Verified Statement of Dr. G. David Emmitt in *Coal Dust I*.

III. Conclusion

The safe harbor approach set out in BNSF's Coal Loading Rule will effectively reduce most coal dust losses through measures that are straightforward and can be implemented without significant changes to or interruptions in the existing loading process at PRB mines.

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 September 28 2012

E. Daniel Carré

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 September 28, 2012

Mark Murphy

CARRÉ/MURPHY EXHIBITS

EXHIBIT 1

Edward Daniel Carré

Meteorologist/Environmental Scientist

154 Jefferson Drive
Palmyra, Virginia 22963
daniel.carre@gmail.com

Education

University of Virginia, Charlottesville, VA
Masters of Science in Environmental Science, 2003 – 2005
Thesis: *Influences of hydrocarbon emissions by Larrea tridentata on the thermal structure of the lower atmospheric boundary layer*

Millersville University, Millersville, PA
Bachelor of Science in Meteorology, GPA 3.30 / 4.00, 1999 – 2003

Professional Work Experience

Simpson Weather Associates, Charlottesville, VA
Research Scientist and Assistant Director – Environment and Energy Division, 6/15/05 – Present
- Manage a team of eight employees and contractors for a division of an environmental consulting company responsible for installation, maintenance, analysis, and reporting of weather and air quality data collection sites
- Responsible for data analyst and IT team tasked with collection, storage, analysis, presentation, and archiving of large datasets
- Analyze collected data and present synthesized information to decision-makers of clients (small to large-sized companies)
- Compose scientific proposals including research, operational, and budgetary planning
- Plan and complete field campaigns of air quality studies
- Collaborate with various organizations to maximize efficiency during field campaigns

Professional Presentations

- W. E. VanHook, C. Sultana, and **E. D. Carré: BNSF Railway and Union Pacific Railroad Super Trial Results for End of September 2010**. BNSF Special Meeting to BNSF Super Trial Participants, Fort Worth, TX, October 27, 2010.

- W. E. VanHook, C. Sultana, and **E. D. Carré: BNSF Railway and Union Pacific Railroad Super Trial Results for End of July 2010**. BNSF Special Meeting to BNSF Super Trial Participants, Fort Worth, TX, August 5, 2010.

- **E. D. Carré: BNSF Super Trial January – February 2010 Update**. BNSF Special Meeting to BNSF Super Trial Participants, Fort Worth, TX, May 12, 2010.

- **E. D. Carré: BNSF Super Trial January – February 2010 Update**. BNSF Special Meeting to BNSF Super Trial Participants, Fort Worth, TX, March 25, 2010.

Professional Presentations (cont'd)

- W. E. VanHook, G. W. Bowen, C. Sultana, G. D. Emmitt, M. R. Murphy, and **E. D. Carré: Coal Dust Mitigation – Testing Results & Performance Standard**. BNSF Special Meeting to National Coal Transportation Association (NCTA), Fort Worth, TX, November 15, 2007.

- W. E. VanHook, G. W. Bowen, C. Sultana, G. D. Emmitt, M. R. Murphy, and **E. D. Carré: Mitigation of Coal Dust**. BNSF and UP Special Meeting to National Coal Transportation Association (NCTA), Fort Worth, TX, August 24, 2007.

- G. D. Emmitt and **E. D. Carré: April Test Train: Preliminary Coal Car Load Profiling System (CCLPS) Results**. National Coal Transportation Association (NCTA) Special Meeting, Denver, CO, June 21, 2006.

- G. D. Emmitt **and E. D. Carré: Optimizing Rail Availability for PRB Coal Transport: Summary of Trends**. NCTA Special Meeting, Denver, CO, June 21, 2006.

- G. D. Emmitt and **E. D. Carré: Recommendations for the PRB Coal Loss Mitigation Program**. NCTA Special Meeting, Denver, CO, June 21, 2006.

- G. D. Emmitt and **E. D. Carré**: **Coal Loss Study Update.** NCTA Workshop, St Louis, MO, February 21, 2006.

- G. D. Emmitt and **E. D. Carré: CCLPS Estimates of Coal Losses by Wind Erosion.** NCTA Workshop, St Louis, MO, February 21, 2006.

- G. D. Emmitt, **E. D. Carré,** L. Wood, and C. Palomares: **Coal Losses from Railcars: Summary of Data Analyses**. NCTA Special Meeting, Ft. Worth, TX, November 15, 2005.

Publications

- **Carré, ED,** Potter EP, Fuentes JD, Hayden BP, 2005: **Comparative Atmospheric Energy Exchanges over Creosote and Grass Landscapes in Central New Mexico.** American Geophysical Union Joint Meeting, New Orleans, LA.

- **Carré, ED**, Fuentes JD, 2004: **Synoptic and Atmospheric Transport Influences on Rural Ozone Pollution**: University of Virginia 19th Annual Department of Environmental Sciences, Environmental Sciences Research Symposium.

- **Carré, ED**, Fuentes JD, 2004: **Synoptic and Atmospheric Transport Influences on Rural Ozone Pollution**. University of Virginia 2nd Annual Graduate Research Exhibition.

- **Carré, ED**, Hughes, PJ, Sampson, S, Hanna, CL, Clark, RD, 2003: **Funding Student Participation at the Annual Meeting: The Millersville University Case Study**, June 2003, *Bulletin of the American Meteorological Society*, pg. 809-810.

Publications (cont'd)

- Walker, R., Jr., Terry AJ, Atkins SL, Theis ML, **Carré ED**, Barbush JM, 2002: **Measurements of Meteorological Variables and Trace Gas Concentrations During NE-OPS 2001 using a Tethered Atmospheric Observing System**. First AMS Student Conference Poster Session, 82nd Annual Meeting of the AMS, Orlando, FL.

Society Membership

- National Chapter of the American Meteorological Society, 2001 – Present
- American Geophysical Union, 2004 – Present
- Air & Waste Management Association, 2004 – Present
- International Association for Urban Climate, 2004 – Present
- Virginia Piedmont Chapter of the American Meteorological Society, 2003 – 2005, **Co-President** 2003 – 2004, **President** 2004 – 2005
- Millersville University Chapter of the American Meteorological Society, 1999 – 2003, **President** 2002 – 2003

Academic Awards

- University of Virginia Department of Environmental Sciences Departmental Research Award, 2005, *Influences of Hydrocarbon Emissions by Larrea Tridentata on the Atmospheric Energy Exchange Processes in Central in New Mexico*
- University of Virginia Department of Environmental Sciences Award for Most Outstanding First Year Graduate Student in Atmospheric Science, 2005
- University of Virginia Department of Environmental Sciences Michael Garstang Atmospheric Science Award, 2005
- University of Virginia Environmental Science Organization Excellence Award, 2005
- Recipient of the University of Virginia Department of Environmental Sciences Exploratory Research Award, 2004, *Influences of Hydrocarbon Emissions by Larrea Tridentata on the Thermal Structure of the Lower Atmospheric Boundary Layer in New Mexico*
- Recipient of Governor's Fellowship, University of Virginia, 2004
- Recipient of Dean's Fellowship, University of Virginia, 2004
- Recipient of American Meteorological Society Student Assistantship Grant for American

Academic Research Experience

Thesis Research University of Virginia Department of Environmental Sciences,
Influences of hydrocarbon emissions by Larrea tridentata on the thermal structure of the lower atmospheric boundary layer, Sevilleta Long Term Ecological Research Station, San Acacia, NM, Spring 2004 – Summer 2005

Howard University Beltsville Laboratory, Beltsville, MD
Research Scientist, June – August 2003

North American Research Strategy for Tropospheric Ozone-Northeast Oxidant and Particle Study 2001 (NARSTO NE-OPS), Philadelphia, PA
Research Scientist, July 2001

Teaching Experience

Head Teaching Assistant Atmosphere and Weather Laboratory – University of Virginia, Charlottesville, VA
Fall 2004 – Spring 2005

Teaching Assistant Atmosphere and Weather Laboratory – University of Virginia, Charlottesville, VA
Spring 2004 – Spring 2005

EXHIBIT 2

MARK R. MURPHY, B.S., M.B.A.

EDUCATION

M.B.A. Jacksonville University, 1992
B.S. Geography, Salem State University, 1978

Other Training

MSHA – US Mine Safety and Health Administration, Experienced Miner with Annual Updates
Tank Car Specialist, Transportation Technology Center, Emergency Training Center, 1998
Incident Commander, Transportation Technology Center, Emergency Training Center, 2002
Certification in Environmental Auditing, Arthur D. Little Center for Environmental Excellence, 1995
Registered Environmental Manager (REM) NREP, 1990

EMPLOYMENT HISTORY

2005-Present	Principal/Vice-President Conestoga-Rovers & Associates, Dallas, TX and Little Rock, AR Named CRA Principal/Vice President, 2011 Named CRA Associate, 2005
2002-05	BNC Environmental, Dallas, TX and Topeka, KS (acquired by CRA in 2005)
2001-02	National Director of Emergency Response Services, Retec, Southlake, TX
1998-01	Director of Environmental Remediation and Hazmat Services, Hulcher, Denton, TX
1996-98	KEI Consultants, Dallas, TX
1995-96	Kemron Environmental Services, Jacksonville, FL
1983-96	CSX Transportation, Jacksonville, FL
1980-83	The Austin Company, Cleveland, OH

PROFILE OF PROFESSIONAL ACTIVITIES

Mr. Murphy was instrumental in the development of **CRA FIRST** (Fast Incident Response Service Team) to deploy to client environmental emergency events across a network of CRA offices. Teams of highly qualified responders, emergency management/oversight personnel, and air monitoring/modeling and industrial hygiene professionals have been provided specific training and procedures to provide a complete range of incident response services to CRA clients across much of North America.

Railroad Spill Events

- Mr. Murphy has participated in over 300 railroad related responses. They cover a wide range of chemicals and various locations across the United States, Canada, and Mexico. Projects outlined below are a small cross section of events.
  - Emhouse, Texas – PM and Incident Commander for 35,000-gallon phenol spill.
  - Magnolia, Texas – PM and Incident Commander for 33-car derailment. Chemical of concern were SVOC and VOC compounds.

- Boligee, Alabama – PM and Incident Commander for a large derailment adjacent to a protected waterway. Work included identification of endangered species and mitigation efforts for protection.
- Eunice, Louisiana – Managed site restoration activities for large-scale spill event for a Class 1 railroad. Included in this work was coordination of on-scene health and safety efforts supporting re-railing activities.
- Cameron, Texas – PM and Incident Commander for large-scale train derailment. The chemicals of concern included vinyl chloride, vinyl acetate, petroleum distillates and plastic pellets.
- Shawnee, Oklahoma – PM and Incident Commander for a wooden trestle bridge fire which resulted in the derailment of 26 cars and 3 locomotive.
- Tulsa, Oklahoma – PM and Incident Commander for a derailment into a waterway of large amounts of diesel fuel.
- Glacier National Park, Snowshoe, Montana – Provide PM, Incident Command and regulatory interface with multiple agencies for protection of endangered species impacted as a result of multiple derailment events. Received award from Governor of Montana for efforts taken on behalf of a Class 1 railroad.
- El Dorado, Ar. – provided emergency response air monitoring services and land based assessment to a combination Pipeline Spill event on a Railroad Right-of-Way.

Oil and Gas Pipeline Spill Events

- Jean Lafitte Parrish, Louisiana – Provide PM, Incident Command, Logistic and Planning functions for a large international Oil/Gas Company with a pipeline spill event.
- Texas City, Texas – Provided Planning function under the IC structure for a large international Oil/Gas Company and oversight of contractors on site.
- Luling, Texas – Provided Project Management and Incident Command for a pipeline release into a protected river environment during flood stages.
- White Oak, Texas - Provided Project Management and Incident Command for a pipeline release into a protected river environment.
- Edmond, Oklahoma - Provided Project Management and Incident Command for a pipeline release into a residential neighborhood.
- Texas City, Texas – Coordinated land and water based emergency response activities, provided real time air monitoring on site and off site to protect workers as well as off site receptors from inhalation hazards.

Natural Disaster

- Del Rio, Texas – Provided emergency response assistance to state and federal agencies for large-scale flooding. Provided logistic assistance of equipment and manpower for creek and stream clearing. This included body recovery and disposition of generated hazardous and non hazardous waste.
- Victoria, Texas - Provided emergency response assistance to state and federal agencies for large-scale flooding. Provided logistic assistance/management of equipment and manpower. This work was directed toward specific creeks and streams in the impact area. This included body recovery and disposition of generated hazardous and non hazardous waste. This work included management of high temperature incineration pits for debris reduction.

- Eastern North Carolina, South Carolina and coastal sections of Georgia – Maintained and managed incident command logistic support to sustain recovery efforts for two Class I Railroads as a result of catastrophic flooding from hurricane activities.
- Oklahoma City, Oklahoma – Developed temporary debris storage and management facility(s) for U.S Army Corps of Engineers and FEMA. These facilities were utilized to segregate and reduce waste for ultimate disposal. Separate hazardous waste storage units were designed and constructed for RCRA waste and un-classified waste with detailed management documentation. This work was conducted during multiple tornado events.
- Western Colorado and Eastern Utah – Provided oversight management and logistical support for wildfire crews. Primary function was equipment scheduling, maintenance and crew sanitary needs.
- Dallas, Texas – Managed field staff and equipment for large-scale washout of 2 miles of track for the Class 1 railroad.
- Savannah, Illinois – Managed a large-scale effort to protect the Class 1 railroad mainline from flooding on the Mississippi river. This project required approximately 30 pieces of heavy equipment, large-scale pumps and dedicated rock trains. This project was successful and maintained the integrity of the rail yard and no disruption on train service.
- Central Oklahoma – Provided manpower and management for wildfire crews. Efforts resulted in a contract with Class 1 railroad to provide them with wildfire suppression equipment at various locations.

Other Spill Events

- Chicago, Illinois – Provided Project Management and Incident Command for gas companies mercury cleanup in residential neighborhoods.
- Morral, Ohio – Provided Project Management and Incident Command activities for a 2.1-million-gallon release of ammonium nitrate that impacted the town of Morrall. Project included multiple residential cleanups, tank demolition, plant reconstruction, and waterway cleanup. Project resulted in an award by the Mayor and City Council for efforts conducted on behalf of an international agricultural products company.
- Fort Worth, Texas – Provided Project Management and Incident Command for large-scale fire and loss of chemical product at a national roofing products manufacturing facility.

General Environmental Projects

- Gillette, Wyoming –Provided technical services to two Major Class 1 Railroads, for the identification and control of loss of coal during transport. Worked extensively with all major stakeholders including, mines utilities and regulatory agencies. Represented clients at the National Coal Transportation Association technical committee meetings as a standing member.
- Various Locations – Provided Phase 1 and Phase 2 Site Assessments for short line railroads during acquisition and/or divestiture of railroad and out parcels properties.
- Legal Counsel – Provided technical assistance to various internal railroad legal departments for regulatory evaluations of solid/hazardous waste rules.
- Morrill, NE – Provided design and construction services for dedicated track side monitoring system to assist in coal dust monitoring for a Major Class I Railroad.
- Denver, CO – Provided ICS training to Corporate Oil & Gas employees, including in field exercises at multiple locations.

- Texarkana, AR – Provided real time air monitoring to Class 1 Railroads during damaged rail car demolition activities. Coordinated multiple staff assignments.

EXHIBIT 3

EXHIBIT 3
IS HIGHLY CONFIDENTIAL

EXHIBIT 4

EXHIBIT 4
IS HIGHLY CONFIDENTIAL

EXHIBIT 5

EXHIBIT 5
IS CONFIDENTIAL

EXHIBIT 6

EXHIBIT 6 PAGE 1
IS HIGHLY CONFIDENTIAL

Source: VanHook Exhibit 3 at 10

EXHIBIT 6 PAGE 3
IS HIGHLY CONFIDENTIAL

EXHIBIT 7

EXHIBIT 7 PAGES 1-2
ARE HIGHLY CONFIDENTIAL

Carre/Murphy Exhibit 7 – MinTech Spraying Video
(included on CD to BNSF's Opening Evidence)

EXHIBIT 7 PAGE 4
IS HIGHLY CONFIDENTIAL

EXHIBIT 8

EXHIBIT 8
IS CONFIDENTIAL

EXHIBIT 9

EXHIBIT 9
IS CONFIDENTIAL

EXHIBIT 10

EXHIBIT 10
IS CONFIDENTIAL

VERIFIED STATEMENT OF RANDALL L. RAHM

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35557

REASONABLENESS OF BNSF RAILWAY COMPANY
COAL DUST MITIGATION TARIFF PROVISIONS

VERIFIED STATEMENT OF RANDALL RAHM
COALTECH CONSULTANTS, INC.

My name is Randall L. Rahm. I am the President of CoalTech Consultants, Inc. I have extensive experience in coal mining and plant operations, with thirty-six years in the coal industry and twenty years working with PRB sub-bituminous coal. My resume is attached to this statement as Exhibit 1.

The purpose of my verified statement is to explain that coal mines in the Powder River Basin ("PRB") and PRB coal shippers already take extensive measures to control coal dust during coal production, processing and handling. I will describe the various activities that coal shippers and mines currently take at the mines and at the power plants to control coal dust. Many of those activities are required under various regulatory mandates. The only part of the process of using coal to generate electricity where coal mines and shippers do *not* currently take measures to manage coal dust is loading coal into railcars for transportation. There is no reason for shippers to exclude this important part of the coal supply process from their coal dust management efforts.

I. The Physical Properties Of Coal Require Careful Coal Dust Management.

Sub-bituminous PRB coal has a number of physical properties that make it necessary to carefully manage coal dust. Unlike bituminous coal, which is dense, sub-bituminous coal is very porous and has a high initial moisture content. When the coal is mined, it begins a degradation process by which the moisture evaporates from the pores and oxidizes, creating coal dust. Handling the coal during crushing and loading at the mines degrades the coal even more, creating additional dust at every step of the process. When the coal is handled and processed for burning at the plants, additional coal dust is produced. Faced with the dusty byproduct of this natural degradation process, shippers and mines take extensive measures to manage coal dust during each phase of coal processing. These measures will be discussed in greater detail below.

The porosity of PRB coal also makes coal dust particularly damaging to the structural integrity of the rail ballast. In areas close to the PRB mines, coal dust blows off loaded rail cars and filters down into the subgrade, weakening the ballast and the underlying track structure. The coal dust in the ballast acts like a sponge, holding water and not allowing it to drain away. As time passes, the fill material under the ballast becomes saturated and loses its structural strength, causing the rails to sink. When the structural integrity of the rail ballast is compromised in this way, the risk of track problems and derailments greatly increases.

Preventing coal dust from settling on the ballast is much more effective in dealing with track stability than maintenance performed after the dust has been deposited on the tracks. Once coal dust penetrates the ballast, the damage is done, and it is very difficult to address it through maintenance alone. Moreover, the type of maintenance required to remove coal dust from deep within the ballast structure is very time consuming, putting large segments of track out of commission for long periods of time and reducing the number of shipments utilities can make. For this reason, it is very important to control coal dust while trains are in transit from the mines to the generating plants and prior to the dust settling in the ballast.

Numerous regulatory agencies have recognized the need to carefully manage coal dust in the production, processing and handling of coal. There is a wide array of regulatory requirements already in place that coal mines and users must comply with to control coal dust. For example, the United States Environmental Protection Agency ("EPA") recently set performance standards for coal preparation and processing plants, which require plants to implement a plan to control fugitive dust from coal handling equipment and open coal storage piles.[1] The EPA recognized that chemical dust suppressants can be effective in reducing coal dust.[2] Further, the EPA also has particulate matter air quality standards limiting emissions of fine particles in the air, including dust.[3] Coal-fired plants have adopted numerous measures to deal with coal dust on stockpiles to comply with these new regulations.

The Occupational Health and Safety Administration ("OSHA") also instituted a National Emphasis Plan for combustible dust that contains policies and procedures for inspecting workplaces that create or handle combustible dusts, including coal dust.[4] OSHA inspectors issue citations to coal processing plants if their facilities do not meet the standards. The Mine Health & Safety Administration also has mandatory standards relating to the accumulation of combustible materials, including excessive dust.[5] Many state agencies also have statutes or regulations setting air quality standards or requiring that mines and plants obtain air quality

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[1] *See* 40 C.F.R. 60.254 (2012).
[2] *See* Standards of Performance for Coal Preparation and Processing Plants, 74 Fed. Reg. 51,954 (Oct. 8, 2009) (to be codified at 40 C.F.R. pt. 60) (recognizing chemical dust suppression agents as one of the approved dust control measures for open storage piles).
[3] *See* 40 C.F.R. 50.7 (2012).
[4] *See* Occupational Safety & Health Administration, Combustible Dust National Emphasis Program, CPL 03-00-008, available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=directives&p_id=3830#purpose.
[5] *See* 30 C.F.R. § 75.400.

permits.[6] For example, in Wisconsin, the state requires that mines maintain air quality monitors on their property boundaries to measure air quality and dust emissions.

These federal and state regulations are a driving force behind the extensive dust suppression activities that mines and coal-fired utilities currently undertake at their facilities to manage coal dust. I describe below the range of activities taken by PRB mines and coal shippers, starting with activities at the mine origins.

II. PRB Coal Mines Undertake Extensive Efforts To Control Coal Dust During The Production of Coal.

To deal with the problem of coal dust and to comply with regulations discussed above, PRB coal mines undertake extensive measures to manage coal dust. I have prepared a diagram that demonstrates the various stages that PRB coal goes through during the mining process. The diagram depicts the typical coal dust management efforts made by mines during each stage. The complete diagram depicting all of the stages is attached as Exhibit 2. I will briefly describe the individual stages of the mining process below, with reference to figures depicting each individual phase of processing.

Stage 1 - Mine to Crusher and Conveyor: After the coal is extracted from the mine, the coal travels from a belt feeder into the crusher building, where it is crushed into smaller particles. *See* Figure 1, below.

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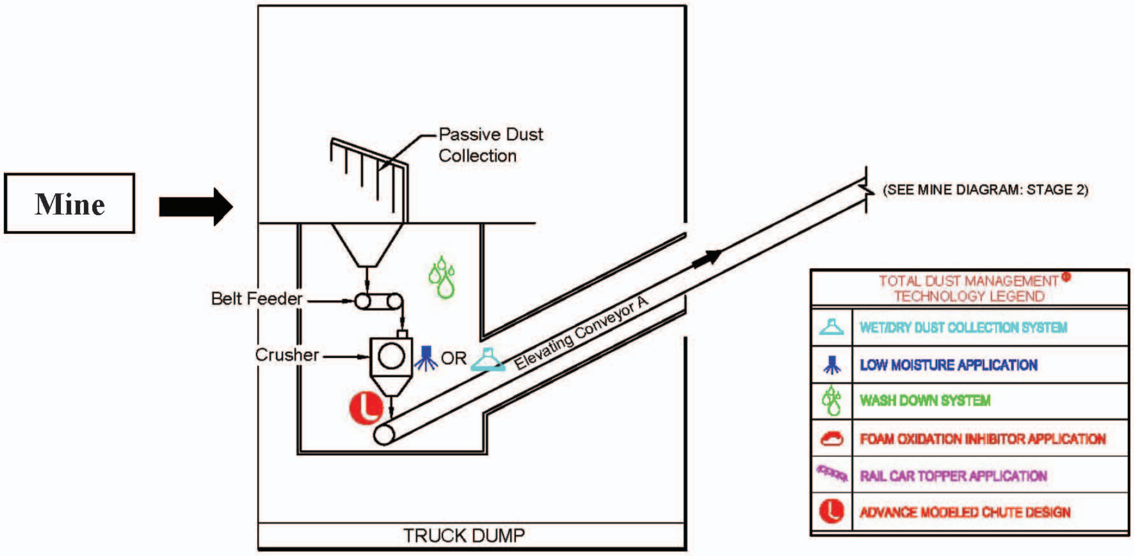
[6] *See*, *e.g.*, Wisconsin Department of Natural Resources, Ch. NR 415, Control of Particulate Dust, available at https://docs.legis.wisconsin.gov/code/admin_code/nr/415/05.

Figure 1: Mine to Crusher and Conveyor



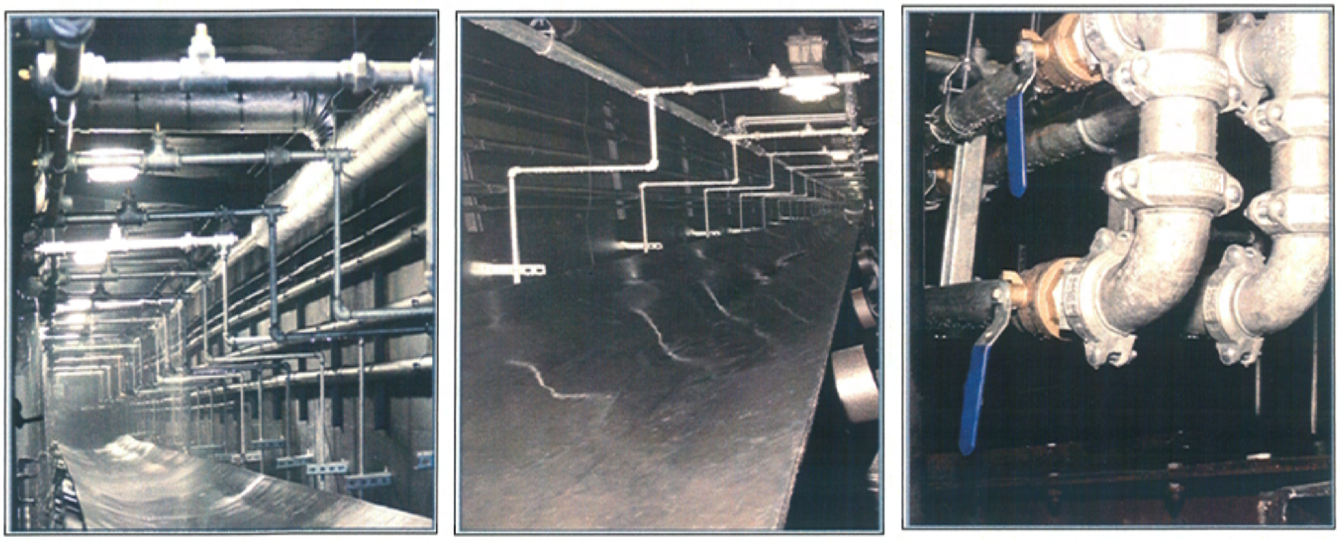
Dumping mined coal into the hopper leading to the crusher creates a large amount of dust, so mines generally install a passive dust collector in an enclosure above the hopper. A passive dust collector allows air to move through a series of baffles hanging from the roof of the enclosure, trapping dust as air passes through. Mines also typically have a dry dust collector or wet dust suppression installed on the crusher to collect or wet the large amount of dust generated during the crushing process. After leaving the crusher, the coal then travels on a series of elevated conveyors to each of the transfer towers. Many mines have invested in advanced transfer chutes on their conveyor belts, as shown in the diagram above, which help contain dust as the coal travels from one point to the next. In addition to these advanced transfer chutes, mines may also use wet or dry dust collection systems on the conveyor belts to keep dust down as coal moves along. These dust collection systems are essentially large vacuums that suck up dust released into the air as the coal moves on the conveyor. Wet dust collection systems shear the dust with water, creating a slurry that is discharged down a drain, while dry dust collection systems discharge the dry collected dust onto a conveyor traveling to the next transfer point, or the dust is pneumatically conveyed away to plant bunkers or silos. Picture 1, below, shows a wet dust collection system.

Picture 1: Wet Dust Collector

As an alternative to wet or dry dust collectors, mines might instead use a low moisture chemical dust suppression system, which applies a wet chemical dust suppressant to the coal as it is loaded onto the conveyor belts.

In addition to the equipment used at various points to gather the coal dust, mines also typically install elaborate wash-down systems in the crusher building and in each of the transfer towers. As shown in picture two, these systems are complex systems of piping and drains used to completely wash the accumulated dust from the ceilings, walls and floors of a building enclosure.

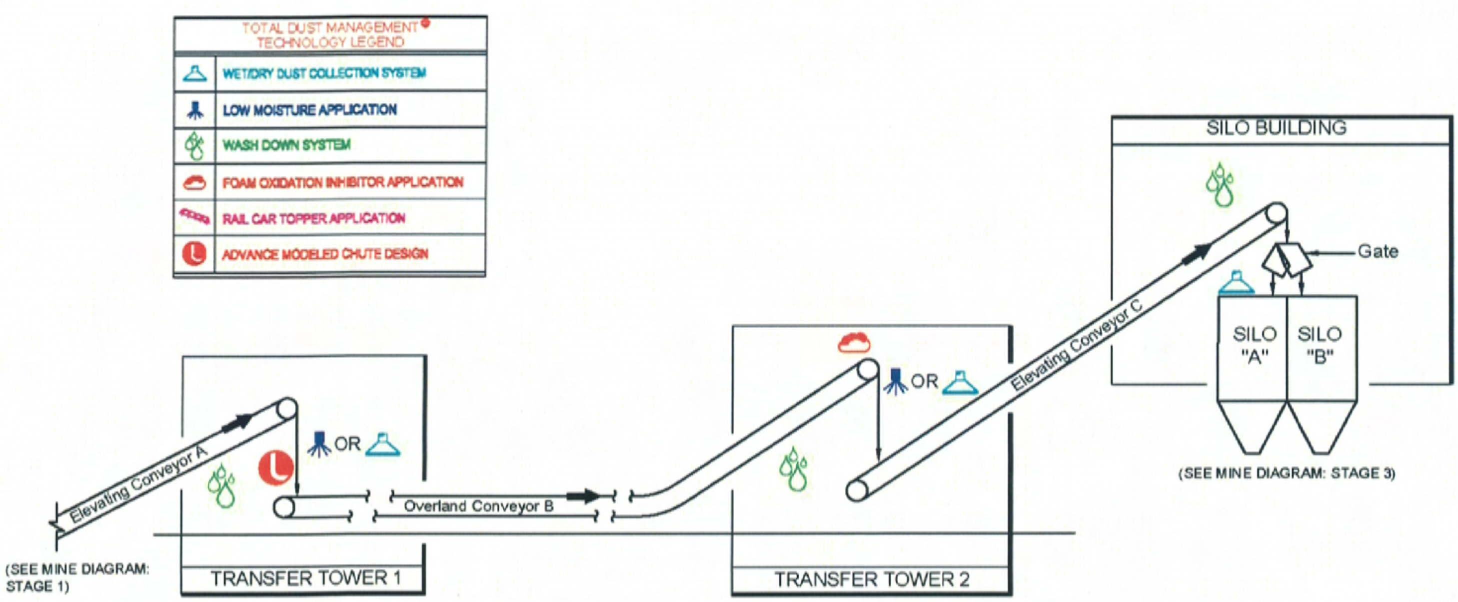
Picture 2: Wash-Down System



These systems, which are installed in all enclosed plant buildings, consist of extensive piping and spray heads located throughout the enclosed area. Each wash-down zone can have up to 80 spray heads, as well as an extensive network of drains.

Stage 2 – Conveyors to Storage Silos: During this step, the coal travels along multiple conveyors through several transfer towers, then up an elevated conveyor from which it is loaded into a silo.

Figure 2: Conveyors to Silo



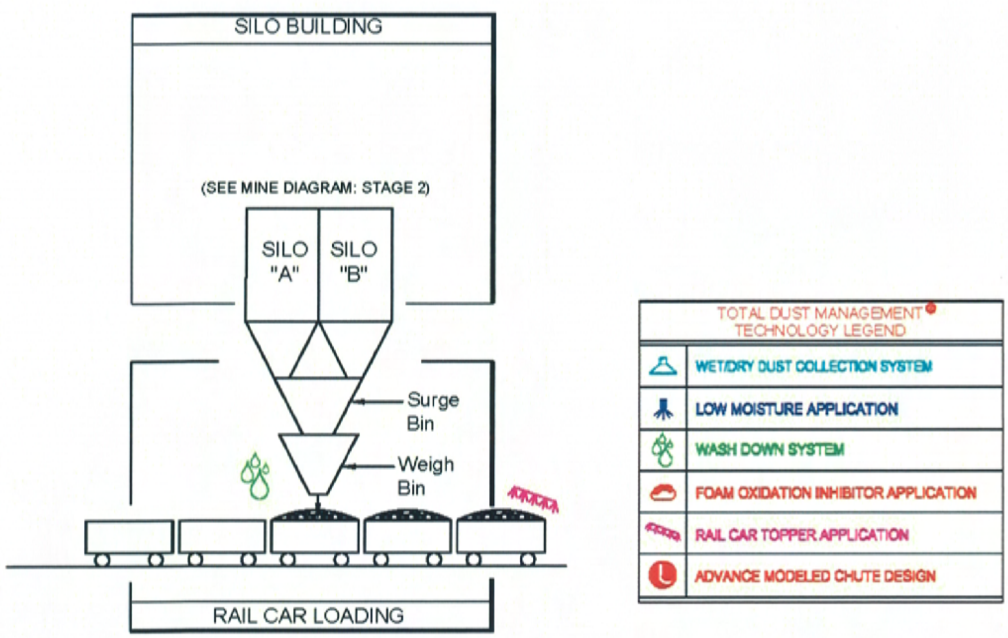
During this phase, a typical mine will use a dust collection system or a low moisture chemical suppressant in the chutes at various transfer points. These systems help reduce the dust that is created as the coal is transferred from one conveyor to the next. Many mines have also installed new transfer chutes on their conveyor belts to contain the dust as it travels along the belt. These advanced chutes use specially designed skirt boards around the chutes to contain the dust as the chutes load onto the conveyor belts. An example of an advanced transfer chute can be seen in Picture 3, below.

Picture 3: Advanced Transfer Chute

Most mines also use a wet or dry dust collector in the silo loading area to collect dust created as the coal is discharged from the silos. Most mines also have wash-down systems in all enclosed areas containing the conveyor belts, and in the silo loading area. In some cases, mines may also apply a body treatment chemical or a foam oxidation inhibitor to the coal before it enters the silo prior to railcar loading. These are chemicals that slow down the coal's natural degradation process and reduce the amount of coal dust that is created as time passes while the coal is transported from the mine. Oxidation inhibitors are most often used for export coal so it can be stored for long periods of time on barges or at ports prior to loading ships.

Stage 3 – Storage Silos to Railcar Loading: During this phase, the coal travels from the silos into a large surge bin, where it is weighed before it gets loaded into the railcars.

Figure 3: Storage Silos to Railcar Loading



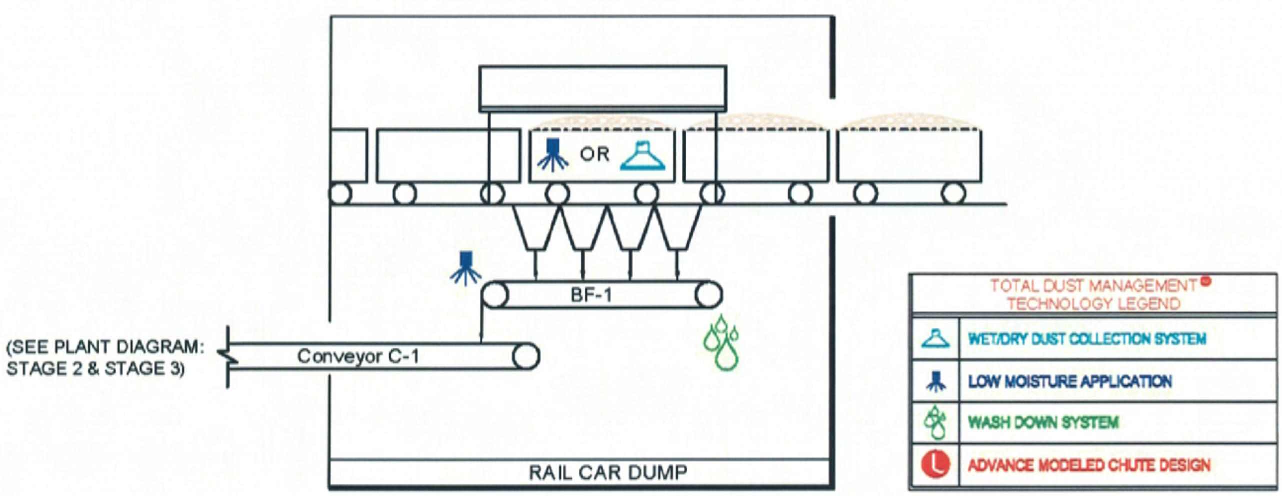
At this point, mines will generally use a wet or dry dust collection system above the surge bin to collect the large clouds of dust that form when the coal is dumped into the bin. Mines also typically install wash-down systems near the railcar loading area, to wash away the dust that collects as the coal is dumped into the railcars. It is at this point in the mine process that a topper agent is applied to manage coal dust in transit. The topper application systems generally involve spray bars with overlapping spray nozzles that can be operated automatically as the loaded cars pass beneath the spray mechanism.

III. Coal Shippers Also Take Extensive Measures To Control Coal Dust At The Plant.

Like the mines, shippers take extensive measures to control coal dust at their power plants. I have created a second flow diagram that demonstrates the main stages of coal processing at an electric utility plant that illustrates the types of coal dust management measures undertaken by utilities during each stage. The complete diagram depicting all of the phases is attached as Exhibit 3. While each utility is somewhat different, every plant employs some combination of these control measures. This diagram depicts the coal dust management efforts made at a typical plant. I will briefly describe the individual stages of the coal plant process, with reference to figures depicting each individual stage.

Stage 1 – Railcar to Rotary Dump: At this stage, the coal enters the plant after being transported by railcar from the mine.

Figure 4: Railcar to Rotary Dump



Upon arrival, the coal is dumped from the railcar onto a belt feeder ("BF-1" in the diagram above). When the railcars are overturned and dumped, a large amount of dust is released as the coal drops onto the belts. A typical plant will use wet or dry dust collectors above the rail car dump to collect some of that dust. A dry dust collector of the type used in connection with a rotary car dumper is shown in Picture 4, below.

Picture 4: Dry Dust Collector on a Rotary Car Dumper

As an alternative to wet or dry dust collectors, plants might instead apply a low moisture chemical suppression agent to the coal as it is dumped from the railcar and again when it is deposited onto the belt feeder. Examples of these systems can be seen in Pictures 5-6, below.

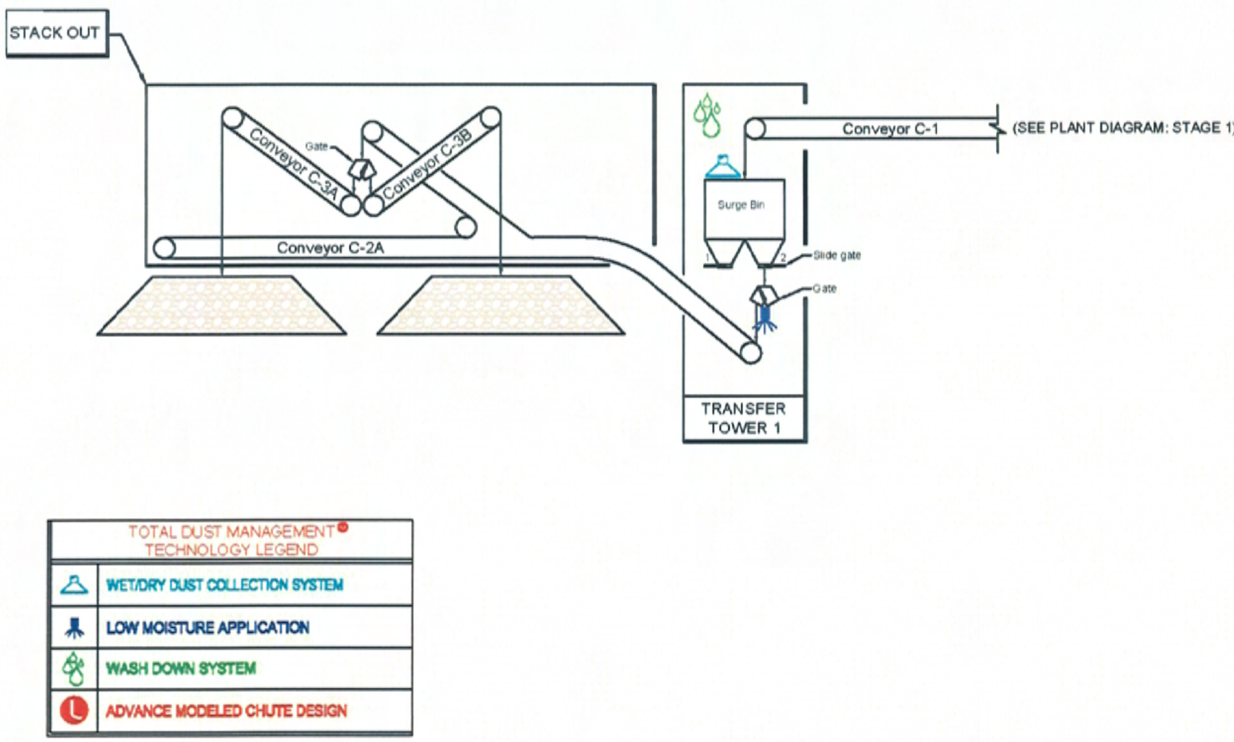
Picture 5: Low Moisture Chemical Suppression System

Picture 6: Low Moisture Chemical Suppression on a Rotary Car Dumper

Typically, plants also have a wash-down system near the rotary car dump area to wash away the float of dust that covers the floors and walls as a result of the coal being dumped out of the rail cars. As discussed above, wash-down systems are also used by mines, and Picture 2 above shows the extensive system of plumbing and drains involved in such a system. Coal-fired utility plants generally have wash-down systems in every building enclosure at the facility.

Stage 2 – Rotary Car Dump to Stackout (Short Term Pile): After the coal is dumped onto the belt feeder from the rotary car dump, conveyor belts move the coal through a surge bin to either the short term pile (stackout) or the long term pile (emergency stackout). Figure 5 below illustrates the dust control methods used as the coal travels to the short term pile.

Figure 5: Rotary Car Dump to Stackout (Short Term Pile)



At this stage, the coal travels on a conveyor belt to the surge bin, then over a series of conveyors to the short-term piles in the reclaim areas. Generally, plants use wet or dry dust collectors above the surge bin to absorb the dust released when the coal drops into the bin. Plants also have wash-down systems in each surge bin area. Also, plants typically spray wet suppression agents above the conveyors leading to the coal pile areas to control dust that is lost when the coal is deposited on the short-term coal piles. Pictures 7 and 8 below show short term coal piles with and without the use of chemical suppression agents.

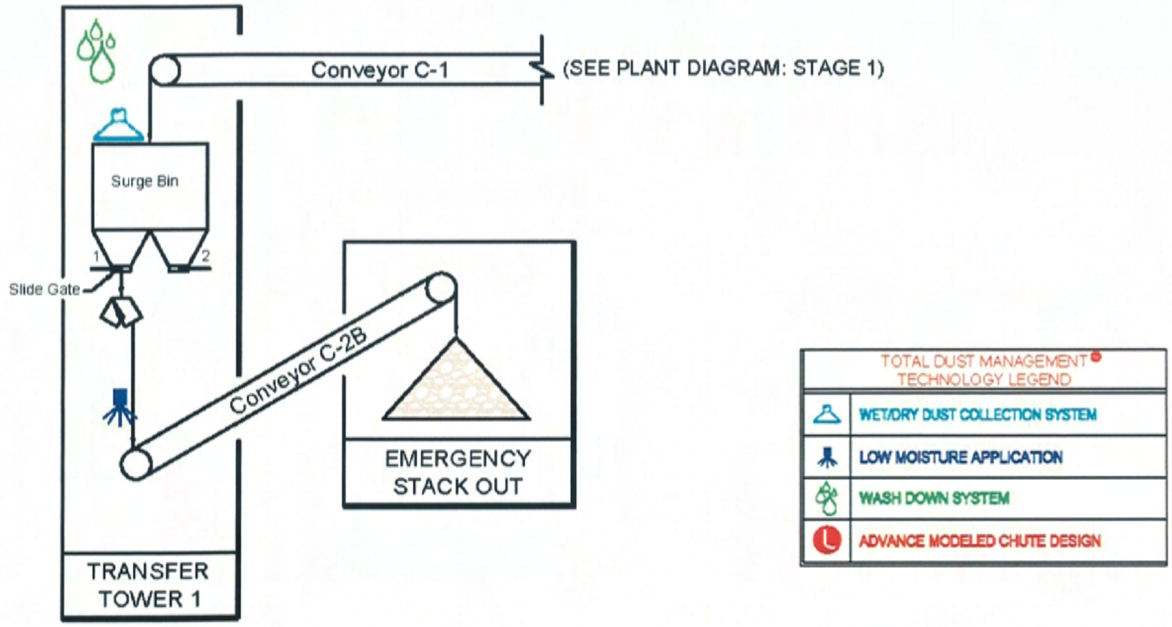
Picture 7: Without Dust Suppression Agent

Picture 8: With Dust Suppression Agent

As an alternative to chemical suppression agents, some plants apply a layer of fiberous mulch to their coal piles to prevent dust from blowing off the piles into the coal yard. Alternatively, some plants spray water on their short-term coal piles to keep dust down as the coal is moved onto and out of the pile. This generally requires the use of large water trucks, either owned and operated by the plant or provided for a fee by an outside water service. When water is used, the piles typically are sprayed daily to keep the coal wet and prevent dust particles from becoming airborne. Many utilities have recognized the superiority using of chemical dust suppressants in reducing coal dust and in preserving the BTU content of the coal over water alone.

Stage 3 – Rotary Car Dump to Emergency Stackout (Long Term Pile): Plants store some of their coal in long-term piles until they are ready to use it. Often, 30 days' worth of coal will be stored on the long term pile. To reach the long-term pile, the coal is discharged onto a conveyor belt from the surge bin, which carries it to the long-term pile, also called the emergency stackout.

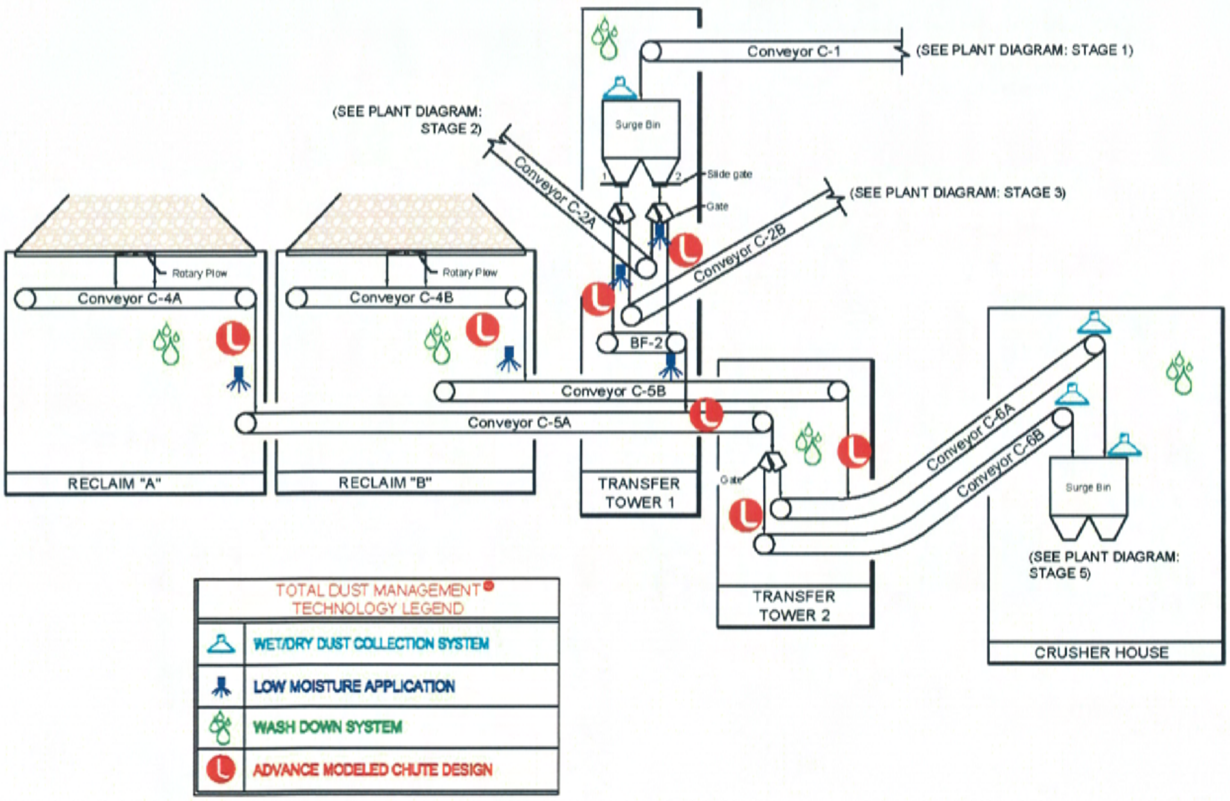
Figure 6: Rotary Car Dump to Emergency Stackout (Long Term Pile)



The conveyor leading to this pile is generally treated with a wet chemical suppression agent. In addition, most plants also compact their long-term piles to remove air and slow the oxidation of the coal, which in turn slows down the coal's natural degradation process. The compaction process involves using a bulldozer or rubber-tired equipment to spread the coal to a 1-1 ½ foot thickness, then running over it to compact the coal to a density of 60-70 pounds per cubic foot. A surfactant may also be applied to the long term coal pile to reduce coal dust. Particularly in colder regions, a utility will seal the long-term piles with encrusting agents to prevent air and water from penetrating the pile during the cold months and to keep dust from coming off of the pile and keep the pile from freezing. These sealants will typically last for six to nine months if not disturbed.

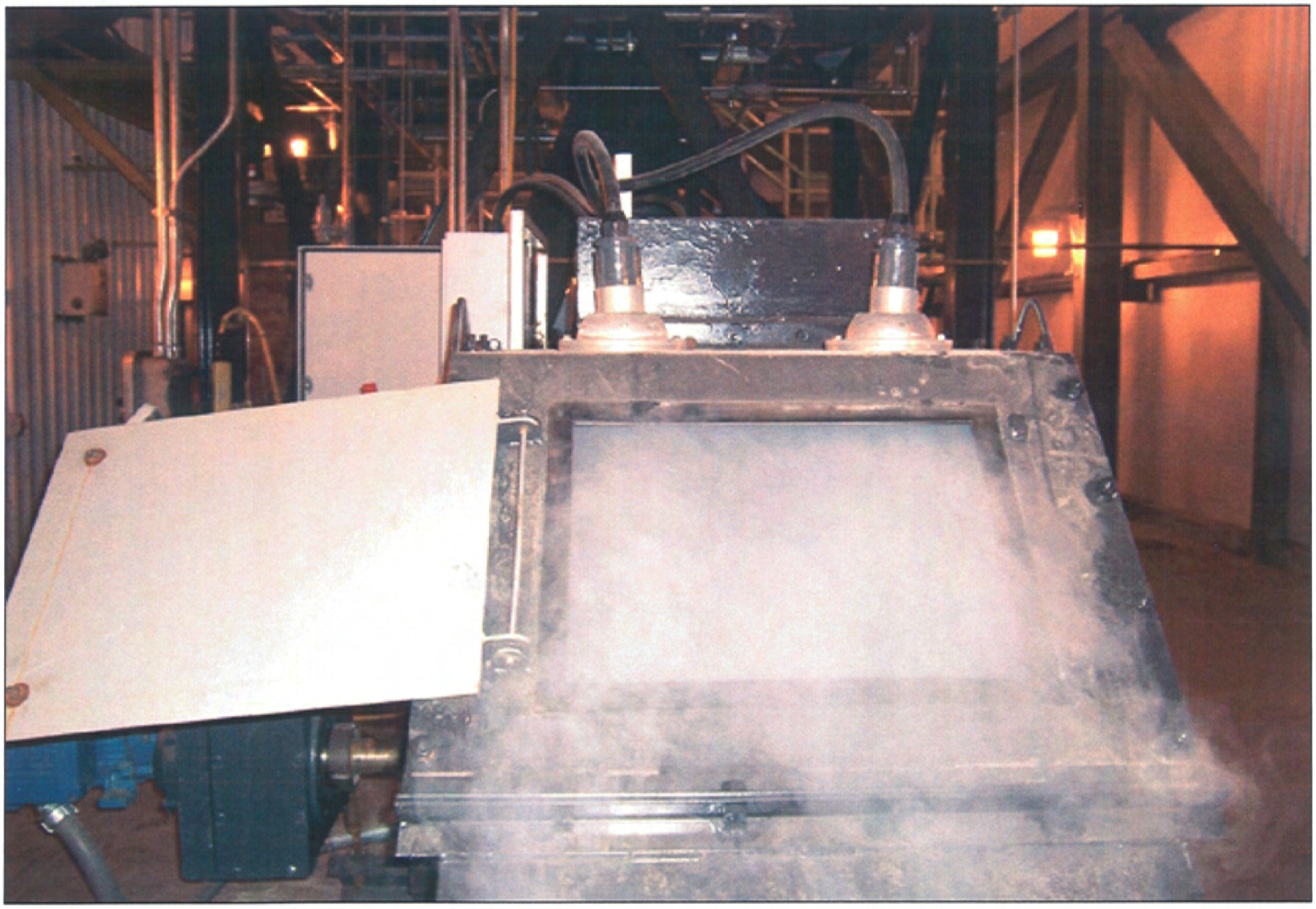
Stage 4 – Coal Pile to Crusher House: At this stage, the coal moves along conveyors from the reclaim areas, which hold the short term coal piles, through multiple transfer towers to the crusher house.

Figure 7: Coal Pile to Crusher House



Typically, utilities will use wet suppression chemicals on each of the various conveyors to keep dust down as it moves along the belts. In some cases, utilities spray water onto the coal as an alternative to chemical suppressants as the coal moves on the conveyors, although the use of excessive amounts of water will affect the heat generating capacity of the coal. Like the mines, many utilities have invested significant funds to upgrade their transfer chutes on their numerous conveyor belts to better contain dust as the coal moves from point to point. Some plants also use dry fog systems in the transfer chutes leading to and from the transfer towers. As shown in picture 9, these systems use compressed air to encapsulate the airborne dust in the chutes and keep it from settling on nearby surfaces.

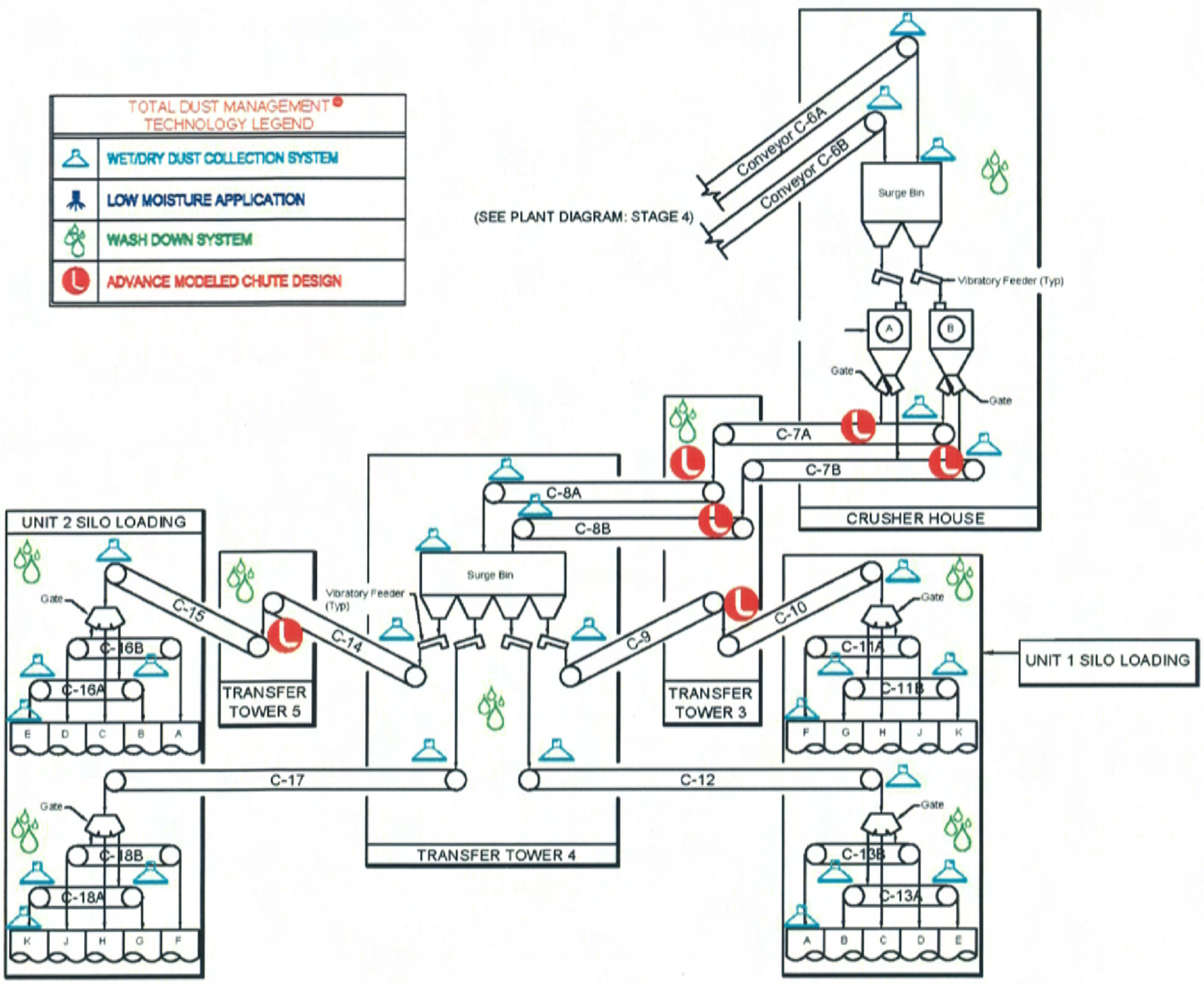
Picture 9: Dry Fog System



Utilities generally have several dust collectors installed near the location where the conveyors dump coal into the surge bin at the crusher house. This equipment contains the clouds of dust that form when the coal is discharged into the bin. There is generally also a wash-down system installed in the crusher house to clean up the dust released when the coal goes through the crushing machines.

Stage 5 – Crusher House to Boilers: In this final stage, the crushed coal moves from the crusher house along a series of conveyor belts into a large surge bin, which feeds into multiple transfer towers leading to the boilers.

Figure 8: Crusher House to Boilers



During this stage, plants typically have wet or dry dust collectors above each of the numerous conveyors leading to the surge bin and through each of the transfer towers. Utilities may also use advanced transfer chutes, discussed above, to move the coal from each conveyor to the next. Wash-down systems are also commonly used in each of the multiple transfer towers and in the surge bin area.

IV. Shippers Should Not Be Able To Avoid Responsibility For Dust Control In Transit When There Are Straightforward Ways To Deal With Coal Dust In The Railcar Loading Process.

As discussed above, mines take extensive measures to deal with coal dust in the mining and loading process, and shippers take extensive measures to deal with coal dust after the coal arrives at the plant. The only part of the process of handling coal where all coal shippers do not currently take measures to control coal dust is in the loading of their railcars in ways that will ensure that the coal will remain in the railcar during transit to the plant. There is no reason for shippers to avoid responsibility for coal dust management in this important part of the coal handling process.

BNSF's safe harbor provision sets out straightforward loading measures that can be taken at the mine to reduce coal dust in transit. The safe harbor requires that coal shippers or their mine agents load coal to an aerodynamic load profile and apply topper chemicals to the loaded coal. These loading measures require little additional effort for shippers and their mines. Moreover, the use of a topper agent applied to loaded coal would have the obvious benefit to shippers of keeping more coal in the cars to be burned at the power plant. The toppers may also provide some residual dust reduction effects after the coal arrives at the plant.

The application of topper agents to loaded coal at the mines to control in-transit coal dust is clearly feasible. I have personal experience in evaluating toppers as a measure of dust control. In the 1990s, I participated in a project with a shipper that was instituting a program to apply a railcar topper agent to its railcars. The program involved the application of an encrusting chemical similar to the chemicals used to seal long-term coal storage piles. In addition, in 2006, I was Chairman of the NCTA Spray Committee when the coal shipper group was first evaluating topper agents for use on railcars in the PRB. In that role, I helped to evaluate several chemical products by reviewing third-party lab test results and dust readings from trackside monitors.

In my experience, topper agents are a very effective method of controlling coal dust losses from loaded railcars. If a quality topper agent is applied properly to the top of a loaded railcar, there should be very little dust that leaves the top of the railcar during transportation. The topper agent seals the top layer of coal, keeping the wind from blowing small particles out of the car and reducing the drying effect that air has on the coal during transit, which leads to increased dusting in transit. I have observed railcars arrive and unload at a plant after being treated with a quality topper agent. I have observed that when trains reach the plant from the mine, the topper agent is still intact. My experience also is that railcars that have been treated with a topper agent also produce less coal dust in the unloading process than untreated cars.

Since it is feasible for coal shippers and their mines to control in-transit coal dust with straightforward measures in the loading process that will not interfere with the existing loading practices, there is no reason for shippers to avoid responsibility for implementing coal dust control in the one remaining phase of coal processing and handling where they do not already take coal dust control measures.

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.

Randall L. Rahm

Executed on September 27, 2012

RAHM EXHIBITS

EXHIBIT 1

CoalTech Consultants, Inc.

- *Coal Risk Management*
- *OSHA NEP Combustible Dust Compliance Audits*
- *Coal Conversions and Upgrades*
- *Project Specification Development and Review*

Experience

- Over 36 years in the coal industry and 25 years specifically in PRB sub-bituminous coals.
- Mr. Rahm founded CoalTech Consultants, Inc. in March of 2008, following nearly two years in the ethanol industry as the COO of Ethanex Energy, Inc. a startup ethanol company.
- Formerly Director – Fuel Services, for Westar Energy, Inc., Mr. Rahm was responsible for the coal procurement of over 13 million tons of PRB coals annually and a transportation fleet of over 1,800 coal railcars.
- Prior to joining Westar Energy in 1999, Mr. Rahm was the Special Projects Manager for Amax Coal West, Inc. in Gillette, WY. From 1991-1993, he managed the world's largest commercial sub-bituminous coal dryer located at the Amax Belle Ayr Mine. The Coal Dryer Project conducted extensive research in the areas of reducing the dried PRB coal's reactive characteristics, dust suppression chemicals for the treatment of the enormous amount of super fine coal dust generated during the drying process, explosion characteristics, spontaneous combustion and coal dust fire-fighting procedures.
- Following the closure of the Coal Drying Project, Mr. Rahm worked with the company's coal sales group, providing their electric power company customers with comprehensive coal-handling risk assessments. This was the beginning of what is now an industry service provided by numerous vendors including CoalTech Consulting, Inc.
- Mr. Rahm was employed with McNally Pittsburg, Inc. for 14 years as Senior Project Manager, engineering and constructing coal dryers, coal preparation plants and handling systems throughout the United States and Canada.
- Mr. Rahm is currently a contributing editor and has authored many articles for Power and Coal Power magazines. He has given presentations at conferences including Edison Electric Institute, National Coal Transportation Association, American Coal Council, ASME, Electric Power, POWER-GEN, AEGIS Seminar, PRB Coal Users' Group, PRB Coal Symposium and at numerous electric utilities.
- Mr. Rahm is an inventor on U.S. Patent 6,086,647 for a coal dust suppressant.
- Mr. Rahm is a past chair of the ASME's Fuels and Combustion Technology (FACT) Division, and is the founder, a former Chairman, and presently Executive Director of the PRB Coal Users' Group. The PRB Coal Users' Group has over 1500 members, of which 823 are from 82 operating companies. Mr. Rahm is in the process of developing the Asian Sub-Bituminous Coal Users' Group. The first meeting will be held in Hong Kong the fall of 2011.
- In 2006, Mr. Rahm was appointed to the National Coal Council by the Secretary of Energy.
- In 2008, Mr. Rahm was a party appointed arbitrator in a AAA arbitration in a coal industry related dispute. A decision was rendered by the panel of three arbitrators following the arbitration hearing.
- Mr. Rahm has been retained by utilities as an expert witness in several coal related lawsuits and has provided expert reports and testimony.

Past Clients

Consulting services have been provided to the following companies: Southern Company, First Energy, NPPD, PacifiCorp, NRG Texas, Westar Energy, KCP&L, Kansas City Board of Public Utilities, City of Colorado Springs, Dynegy Midwest Gen, DTE Energy, Hazard Control Technologies, Fuel Tech, Roberts & Schaeffer Co., NRG - Huntley and Dunkirk Plants, Atlantic City Electric Co., Lafarge NA, Inland Steel, Peabody CoalTrade, OG&E, CH2M Hill, Ontario Power Generation, We Energies, TAQA's Jorf Lasfar Energy Co. Morocco, Steelcase, Holcim US, SynCoal Solutions, GP Consumer Products, HK Electric, CLP's Castle Peak Power Station(Plant Professionals), Alpha Coal Sales, Inc., NewPage Corp., FM Global, Patrick Engineering, OPPD, LG&E, Drax Power Ltd., Chubu Energy and Constellation Energy.

COALTECH Consultants, Inc.

- Coal Risk Management
- OSHA NEP Combustible Dust Compliance Audits
- Coal Conversions and Upgrades
- Project Specification Development and Review

CoalTech Consultants Assessments on Coal Handling Systems

Southern Company ....Plants Miller, EC Gaston, Green County, Scherer and Barry.

GP Consumers ....Georgia Pacific Plants Muskogee, Cedar Springs, Savannah and Green Bay.

DTE Energy....................................Plants Monroe, Belle River, River Rouge, St. Clair, Trenton Channel and Marysville.

NRG Energy ....Plants Dunkirk, Huntley and Limestone

We Energies ....Oak Creek Plant

TAQA...Jorf Lasfar Energy Co. – Morocco

Atlantic City Electric Co.... ....BL England Power Plant

PacifiCorp......................................Plants Dave Johnston and Naughton

Westar Energy ....Plants Jeffrey, Lawrence and Tecumseh

CLP Power Hong Kong..................Castle Peak Power Station

Drax Power Ltd. ....Drax Power Station, UK

Constellation Energy ....CP Crane Station

KCP&L...LaCygne Power Plant

Steelcase ....Steelcase Power Plant

First Energy ....Plants Bayshore, Avon Lake, Eastlake, Sammis and Mansfield.

LG&E ....Trimble County Power Plant

OG&E..Plants Sooner and Muskogee

OPPD...Plants Omaha and Nebraska City

NPPD ....Gerald Gentleman Power Plant

OPG...Thunder Bay and Nanticoke Power Plants

HK Electric .... Lamma Power Station, Hong Kong

NewPage Corp.............................. Biron and Wisconsin Rapids Mills

GP Consumers .... Muskogee, Savannah River, Green Bay and Cedar Springs Mills

Chubu Energy................................Hekinan Thermal Power Station, Nagoya, Japan

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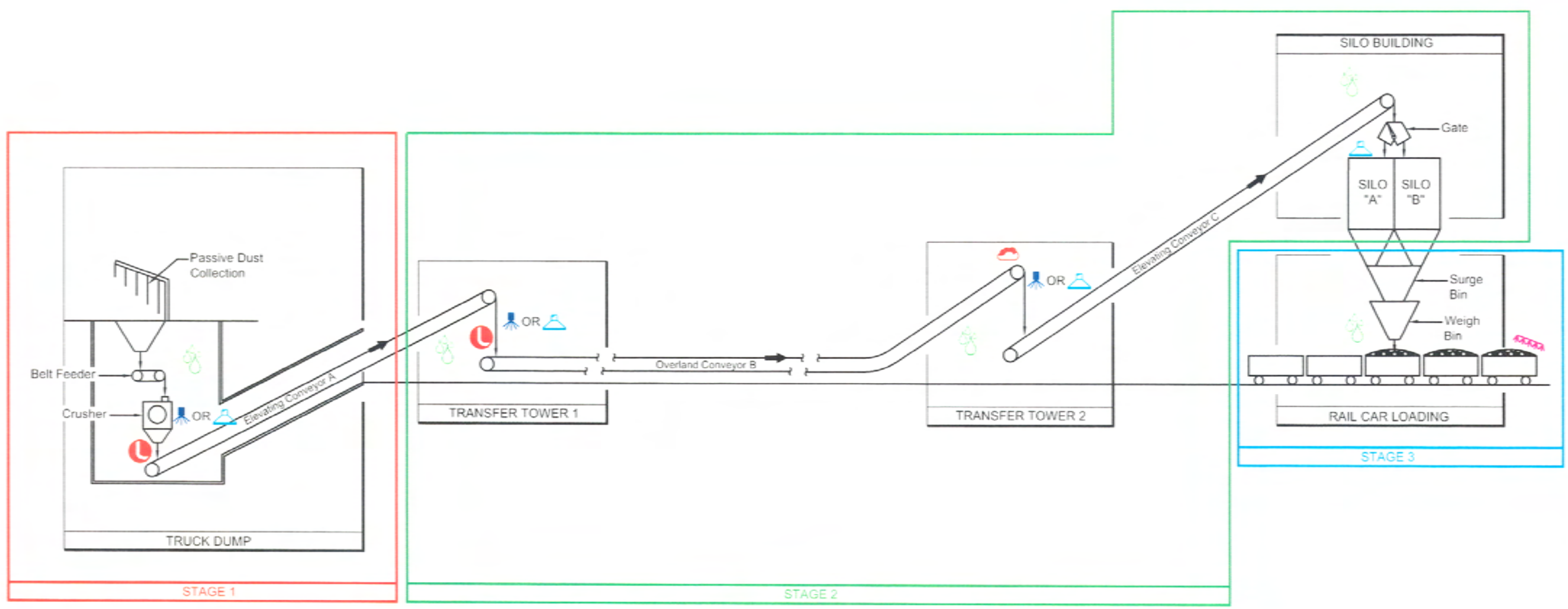
EXHIBIT 2

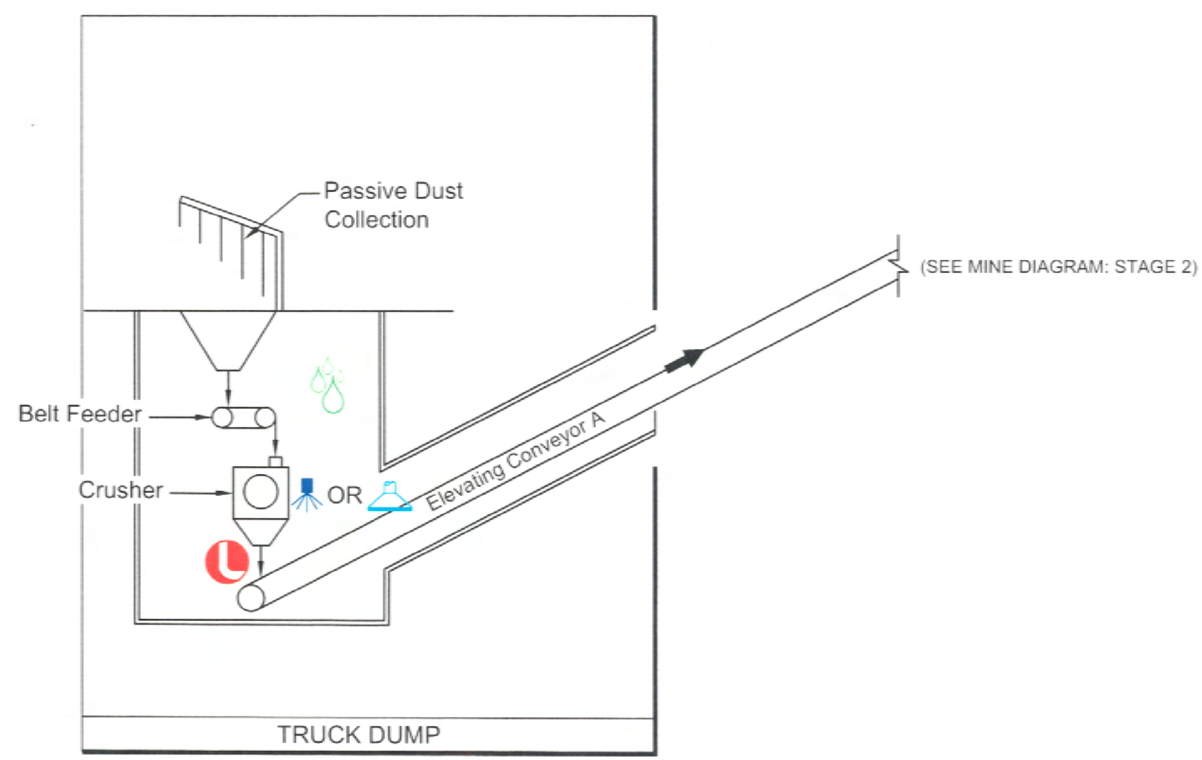
TOTAL DUST MANAGEMENT© TECHNOLOGY LEGEND

- WET/DRY DUST COLLECTION SYSTEM
- LOW MOISTURE APPLICATION
- WASH DOWN SYSTEM
- FOAM OXIDATION INHIBITOR APPLICATION
- RAIL CAR TOPPER APPLICATION
- ADVANCE MODELED CHUTE DESIGN



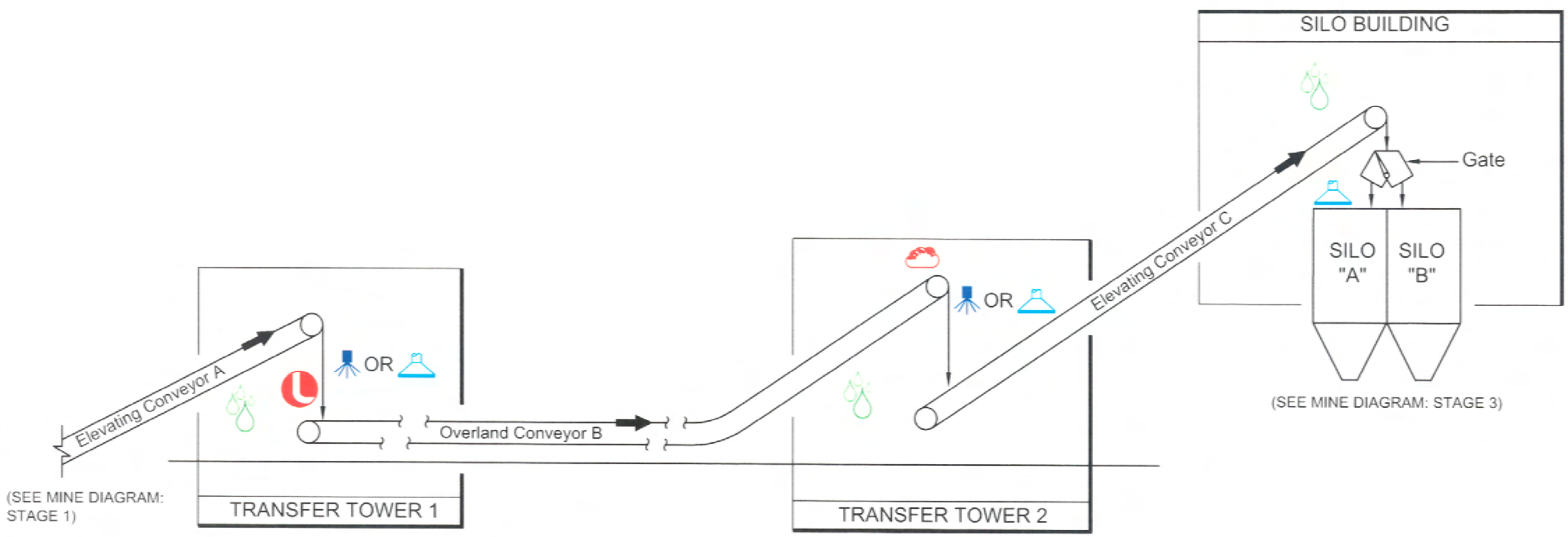
DUST CONTROL TECHNOLOGY IN A MINING COAL HANDLING SYSTEM

TOTAL DUST MANAGEMENT© TECHNOLOGY LEGEND
WET/DRY DUST COLLECTION SYSTEM
LOW MOISTURE APPLICATION
WASH DOWN SYSTEM
FOAM OXIDATION INHIBITOR APPLICATION
RAIL CAR TOPPER APPLICATION
ADVANCE MODELED CHUTE DESIGN



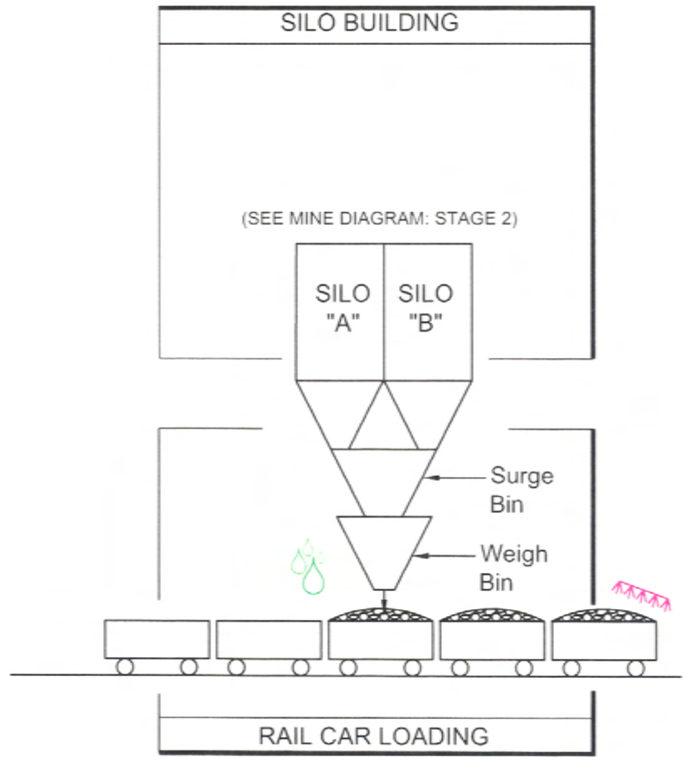
DUST CONTROL TECHNOLOGY IN A MINING COAL HANDLING SYSTEM
MINE DIAGRAM: STAGE 1 - TRUCK DUMP TO ELEVATING CONVEYOR

	TOTAL DUST MANAGEMENT® TECHNOLOGY LEGEND
	WET/DRY DUST COLLECTION SYSTEM
	LOW MOISTURE APPLICATION
	WASH DOWN SYSTEM
	FOAM OXIDATION INHIBITOR APPLICATION
	RAIL CAR TOPPER APPLICATION
	ADVANCE MODELED CHUTE DESIGN



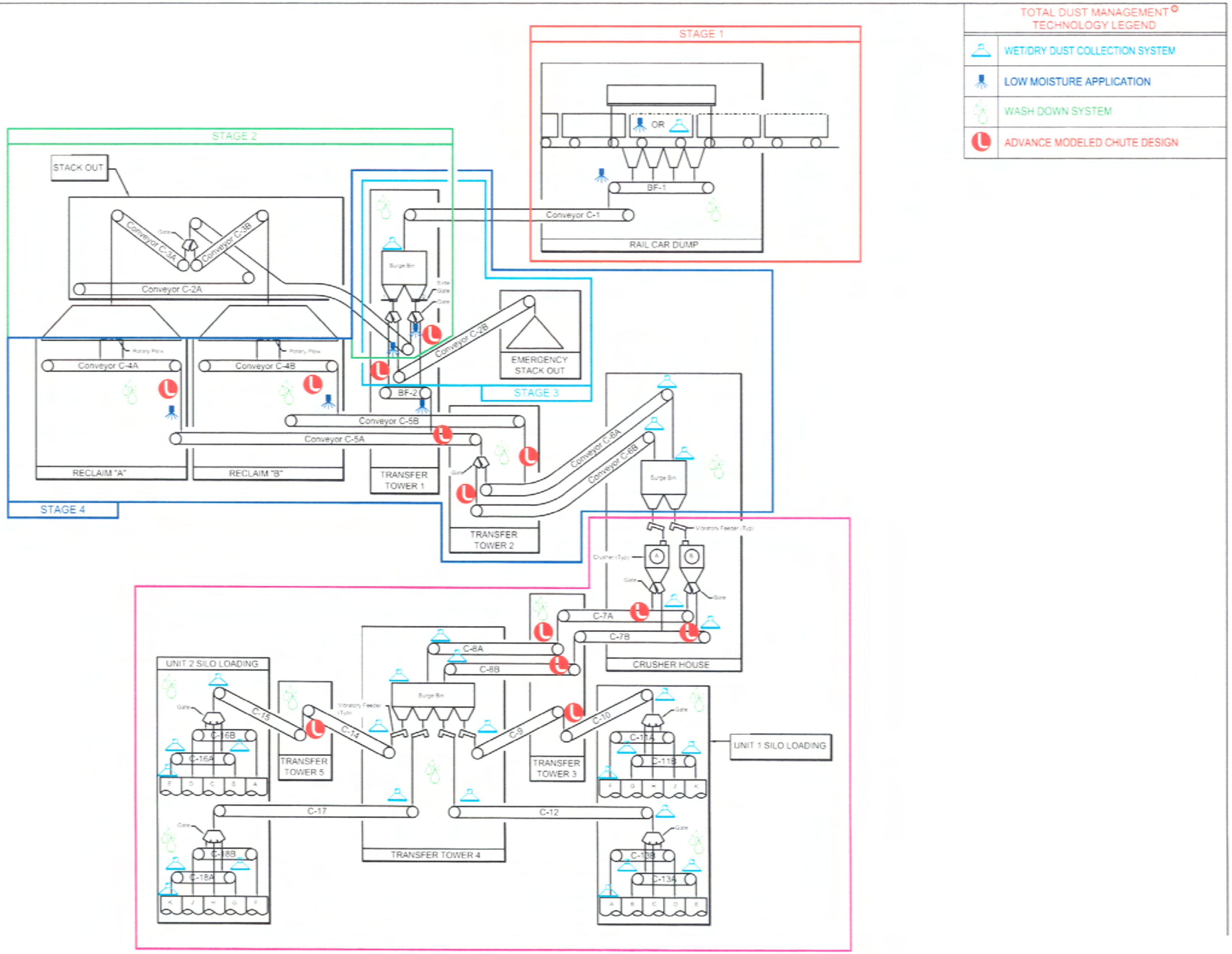
DUST CONTROL TECHNOLOGY IN A MINING COAL HANDLING SYSTEM
MINE DIAGRAM: STAGE 2 - ELEVATING CONVEYOR TO STORAGE SILOS

TOTAL DUST MANAGEMENT© TECHNOLOGY LEGEND
WET/DRY DUST COLLECTION SYSTEM
LOW MOISTURE APPLICATION
WASH DOWN SYSTEM
FOAM OXIDATION INHIBITOR APPLICATION
RAIL CAR TOPPER APPLICATION
ADVANCE MODELED CHUTE DESIGN



DUST CONTROL TECHNOLOGY IN A MINING COAL HANDLING SYSTEM
MINE DIAGRAM: STAGE 3 - STORAGE SILOS TO RAILCAR LOADING

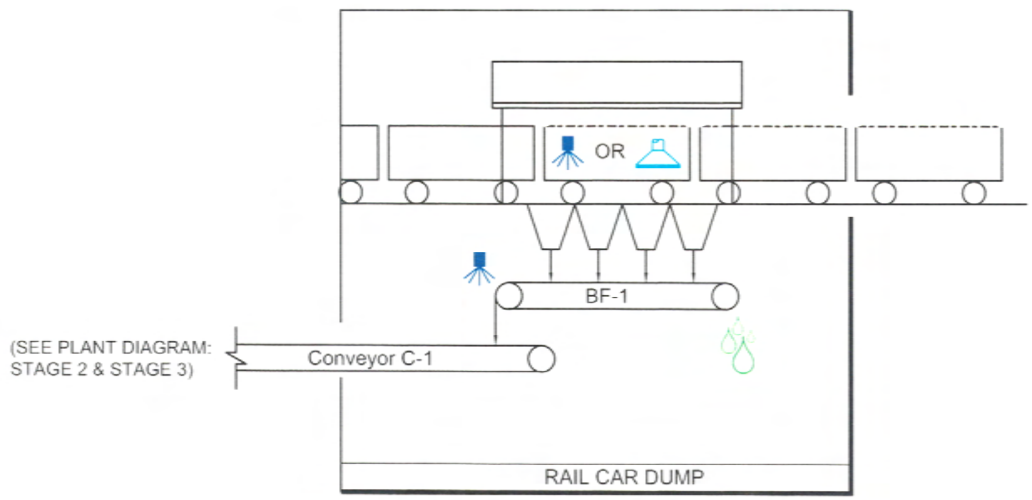
EXHIBIT 3



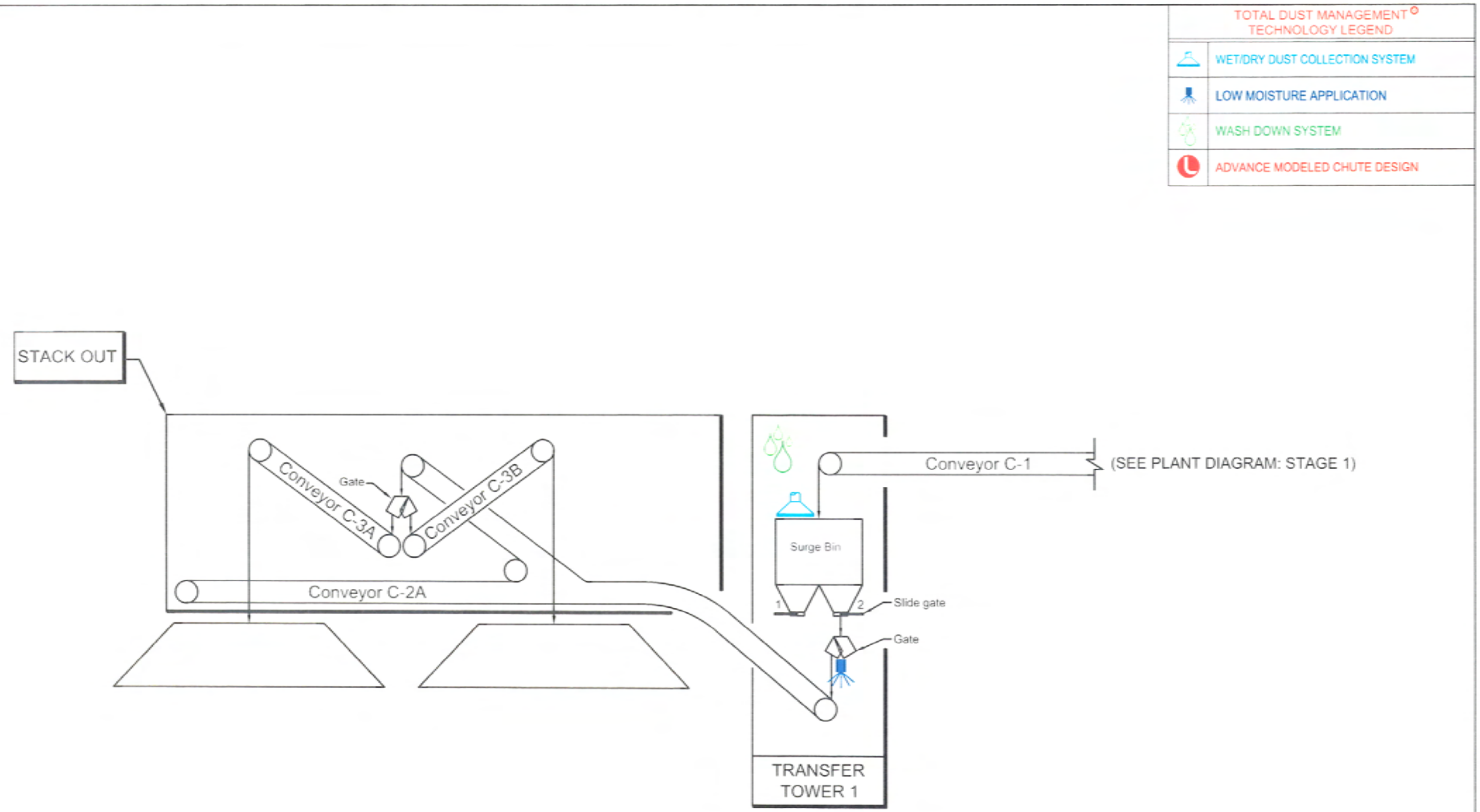
DUST CONTROL TECHNOLOGY IN A POWER PLANT COAL HANDLING SYSTEM

TOTAL DUST MANAGEMENT© TECHNOLOGY LEGEND

	WET/DRY DUST COLLECTION SYSTEM
	LOW MOISTURE APPLICATION
	WASH DOWN SYSTEM
	ADVANCE MODELED CHUTE DESIGN

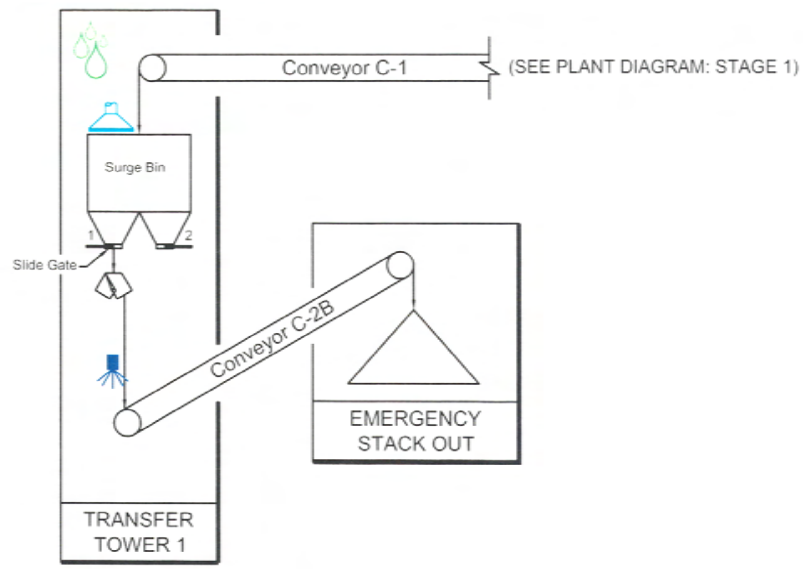


DUST CONTROL TECHNOLOGY IN A POWER PLANT COAL HANDLING SYSTEM
PLANT DIAGRAM: STAGE 1 - RAIL CAR TO ROTARY CAR DUMPER

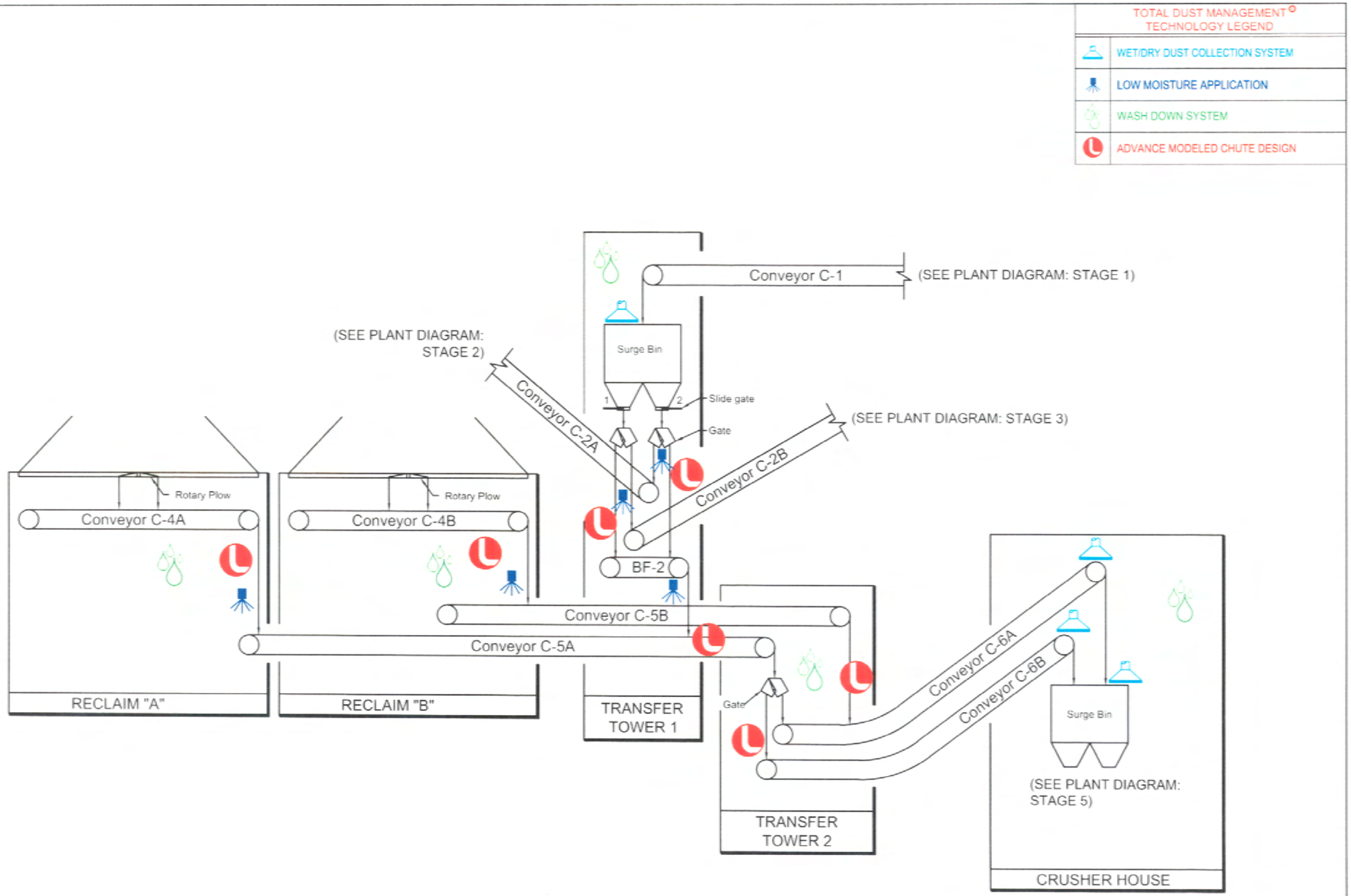


DUST CONTROL TECHNOLOGY IN A POWER PLANT COAL HANDLING SYSTEM
PLANT DIAGRAM: STAGE 2 - ROTARY CAR DUMPER TO SHORT TERM COAL PILE

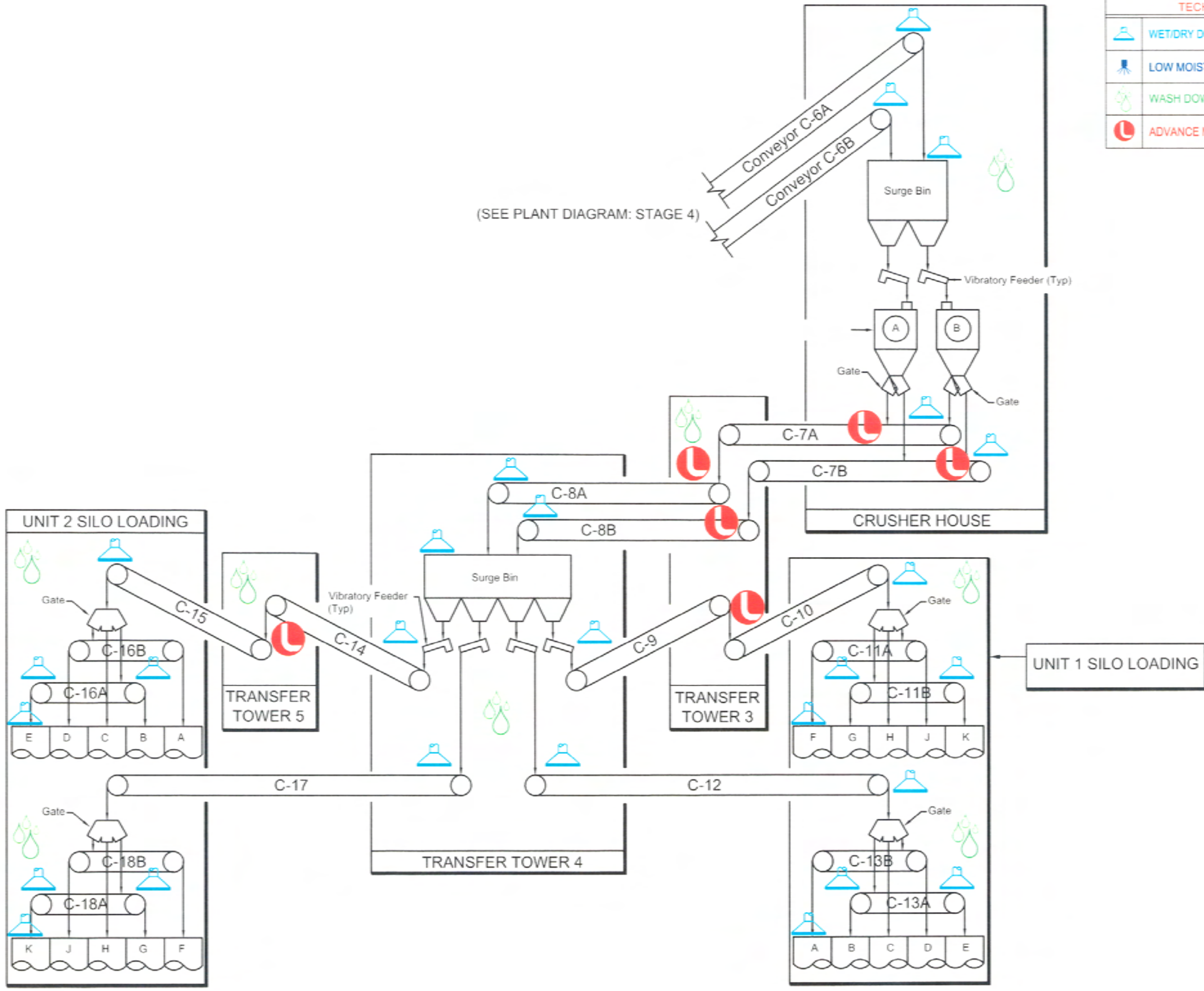
TOTAL DUST MANAGEMENT© TECHNOLOGY LEGEND	
	WET/DRY DUST COLLECTION SYSTEM
	LOW MOISTURE APPLICATION
	WASH DOWN SYSTEM
	ADVANCE MODELED CHUTE DESIGN



DUST CONTROL TECHNOLOGY IN A POWER PLANT COAL HANDLING SYSTEM
PLANT DIAGRAM: STAGE 3 - ROTARY CAR DUMPER TO EMERGENCY STACKOUT (LONG TERM)



DUST CONTROL TECHNOLOGY IN A POWER PLANT COAL HANDLING SYSTEM
PLANT DIAGRAM: STAGE 4 - COAL PILE TO CRUSHER HOUSE



TOTAL DUST MANAGEMENT© TECHNOLOGY LEGEND	
	WET/DRY DUST COLLECTION SYSTEM
	LOW MOISTURE APPLICATION
	WASH DOWN SYSTEM
	ADVANCE MODELED CHUTE DESIGN

DUST CONTROL TECHNOLOGY IN A POWER PLANT COAL HANDLING SYSTEM
PLANT DIAGRAM: STAGE 5 - COAL PILE TO POWER PLANT SILOS

REFERENCE CD