



## Coal Dust Frequently Asked Questions

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### Why is BNSF establishing coal dust emission standards?

BNSF has established coal dust emission standards to ensure the reliability, efficiency and safety of coal transportation out of the Powder River Basin (PRB). BNSF has determined that coal dust escaping from loaded coal cars can foul the ballast along rail lines and can lead to weakened track structure. Coal dust deposits have even caused fires in areas where coal dust has accumulated. BNSF is seeking to promote the uninterrupted flow of coal from the mines in the PRB to coal-fired electric generating stations and to avoid safety hazards, congestion and delays that can result from compromised rail infrastructure.



Joint Line - MP 69  
[Enlarge](#)



Joint Line - MP 29  
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### How extensive is the coal dust problem?

The amount of coal dust that escapes from PRB coal trains is surprisingly large. While the amount of coal dust that escapes from a particular coal car depends on a number of factors, including the weather, BNSF has done studies indicating that from 500 lbs to a ton of coal can escape from a single loaded coal car. Other reports have indicated that as much as 3% of the coal loaded into a coal car can be lost in transit. In many areas, a thick layer of black coal dust can be observed along the railroad right of way and in between the tracks. Given the high volume of loaded coal trains that move each day in the PRB, large amounts of coal dust accumulate rapidly along the PRB rail lines.



Undercutting ballast tailings  
[Enlarge](#)



Note coal dust accumulation  
alongside track  
[Enlarge](#)

### BNSF has been shipping coal from the PRB for decades - why is this coming up now?

The volume of coal transported out of the PRB over the Joint Line by BNSF and UP has increased substantially during this decade. As many as 88 loaded coal trains move out of the PRB in a single day. As PRB coal traffic expanded, the amount of coal dust deposited along the railroad right of way increased to levels that adversely affected PRB coal train operations. In May 2005, there were two significant derailments of coal trains in the PRB within a short period of time, resulting in significant disruption in service and congestion. BNSF determined that the derailments resulted from weakened track structure caused primarily by a combination of coal dust and high levels of rainfall along with other factors. Following the derailments, BNSF undertook extensive efforts to study the scope of the coal dust problem and to identify emission standards that would minimize the accumulation of coal dust on the roadbed. Those efforts resulted in coal dust emission standards that BNSF has established for coal trains operating on the Joint Line and on BNSF's Black Hills subdivision.



Note coal dust deposit  
in ballast drainage area  
[Enlarge](#)



What is below ballast  
when you "scratch the surface"  
[Enlarge](#)



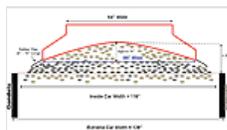
Coal dust in  
ballast section  
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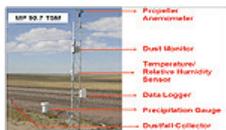
### What are the coal dust standards?

BNSF's coal dust emission standards are contained in Items 100 and 101 of BNSF's Coal Rules publication called Price List 6041-B. The standards require that coal cars must be loaded in conformance with a specified loading template. The new coal loading profile produces a more rounded contour of the coal in coal cars that eliminates the sharp angles and irregular surfaces that can promote the loss of coal dust when cars are in transit.

BNSF's coal dust emission standards also provide that the amount of coal dust emitted from a train may not exceed specified levels as measured by trackside monitors (TSM) at two locations on PRB lines. One TSM is located at milepost 90.7 on the Joint Line and the other TSM is located at milepost 558.2 on BNSF's Black Hills subdivision. A third trackside monitoring station has been constructed on the Big Horn subdivision and is fully operational.



Load Profile Requirements  
[Enlarge](#)



Trackside Monitor (TSM)  
[Enlarge](#)

### When will the standards become effective?

BNSF issued Items 100 and 101 of its Price List 6041-B on May 27, 2009. The requirement in those Items that coal trains meet specific IDV.2 (Integrated Dust Value) limits was originally set to become effective on November 1, 2009. However, in late October 2009, BNSF notified its shippers that it was suspending the effective date of the IDV.2 limits until August 1, 2010 to give the Surface Transportation Board an opportunity to review and affirm the reasonableness of BNSF's coal dust emission standards and to give PRB coal shippers additional time to evaluate alternative means of complying with the standards. BNSF also announced in late October 2009 that it was undertaking a large-scale trial of coal dust mitigation measures so that shippers can obtain more information on the effectiveness of various mitigation measures. BNSF hopes and expects that its suspension of the effective date of the coal dust emission standards and the initiation of a new trial of coal dust mitigation measures will promote voluntary compliance with BNSF's coal dust standards.

#### **What basis does BNSF have for the specific coal dust standards that BNSF has adopted?**

BNSF has been conducting scientific studies of coal dust for several years. Among other things, the studies have involved collecting and analyzing data on coal dust emissions from thousands of trains. BNSF has retained and worked closely with engineering consultants to design monitoring devices for coal dust emissions, to implement protocols for measuring coal dust emissions from particular trains, and to analyze the results of field tests. With its outside consultants, BNSF has determined that limiting coal dust emissions to the IDV.2 levels specified in Items 100 and 101 would reduce coal dust emission levels by about 85%.

#### **Why shouldn't the railroad be responsible for dealing with the coal dust problem instead of coal shippers and coal mines?**

BNSF does not believe that any shipper's commodity that is transported by BNSF should be permitted to escape from the shipping container and foul the railroad's roadbed or surrounding areas. Coal shippers are no different from other shippers who are responsible for securing their freight for transit by rail.

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#### **Why can't BNSF deal with the coal dust problem through increased maintenance?**

Cleaning up coal dust after it has escaped from the coal cars in transit is not an acceptable alternative to taking preventive measures to reduce coal dust emissions. Routine maintenance procedures cannot address the structural problems caused by coal dust that accumulates along the rail lines. Extraordinary maintenance measures are required to deal with this problem. For example, BNSF has found that it must increase substantially the frequency of undercutting – where the ballast is removed, cleaned and replaced – to remove coal dust accumulations. In addition to the high costs of such operations, the increased maintenance activities can adversely affect service availability and reliability. Undercutting operations take rail lines out of service for protracted periods of time. This cuts back on line capacity that would otherwise be available for transporting coal and can lead to congestion and service restrictions.



Undercutter work

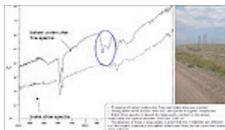
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#### **Could the coal dust problem be related to rapid discharge gates at the bottom of the cars?**

BNSF has done studies over the past three years that have confirmed that while some coal leaks from rapid discharge gates on coal cars, the vast majority of coal dust that is deposited on the railroad right of way comes off of the top of loaded coal cars. BNSF therefore believes that proper maintenance of rapid discharge gates is an important opportunity to reduce the loss of coal in transit, but coal dust mitigation efforts must focus on reducing the level of coal dust emitted from the top of loaded coal cars.

#### **Are there other possible sources of dust or contaminants in the rail ballast?**

Organic chemistry and x-ray diffraction analysis confirm that the preponderance of material fouling the rail ballast is coal. Only minute amounts of brake shoe dust or diesel particulates have been found in the rail ballast.



Infrared spectra diagram

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#### **What types of remediation measures are available to meet BNSF's coal dust standards?**

A number of remediation measures are available to reduce coal dust emissions. In addition to the new

loading profile, chemical agents called surfactants can be sprayed over the loaded coal to keep the coal in place during transit and to reduce coal dust. Other products and services are being explored and developed. BNSF is confident that as coal shippers begin to implement remediation measures and search for the most cost-effective approaches, the market will respond with increasingly effective remediation technologies.

**Have any of these remedial measures ever been used before?**

Yes. Coal dust suppression measures have been used extensively in areas outside the PRB. The most common measure until now has been the application of a surfactant. Surfactants have been used for several years in Canada by the Canadian Pacific to reduce coal dust emissions. In the eastern United States, Norfolk Southern has used surfactants along with the grooming of loaded coal cars since the mid 1970's to limit coal dust emissions. Surfactants are increasingly being used in Australia.

**How do you know that these measures would be effective in meeting BNSF's standards?**

Since 2005, BNSF has been conducting studies in the PRB of coal dust emissions and various measures available to reduce those emissions. These studies have confirmed that the use of surfactants can reduce coal dust emissions to the IDV.2 levels set out in BNSF's coal dust emission standards. In addition, BNSF announced in late October 2009 that that it was undertaking a large-scale trial of coal dust mitigation measures so that shippers can obtain more information on the effectiveness of various mitigation measures. The trial will involve participation by chemical vendors as well as several mines and coal shippers. Different chemical surfactants will be tested in the laboratory and in the field on operating coal trains to determine the effectiveness of different products and services in reducing coal dust emissions. The results will be reported to the test participants. BNSF hopes that this trial will assist coal shippers and their mine agents to identify effective dust suppression measures.



Excerpt of 2010 trial test plan

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**Does the application of a surfactant require large quantities of water?**

Several different chemical agents are available for use as a surfactant to reduce coal dust emissions. Among these products are low-water surfactants.

| BNSF Coal Line Water Usage Chemical Testing Results |                    |                    |                    |                    |                    |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|
| Chemical  | Water Usage (gals) |
| 1   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 2   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 3   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 4   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 5   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 6   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 7   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 8   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 9   | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 10  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 11  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 12  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 13  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 14  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 15  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 16  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 17  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 18  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 19  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 20  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 21  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 22  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 23  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 24  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 25  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 26  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 27  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 28  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 29  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 30  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 31  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 32  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 33  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 34  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 35  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 36  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 37  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 38  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 39  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 40  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 41  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 42  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 43  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 44  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 45  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 46  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 47  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 48  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 49  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |
| 50  | 1.0                | 1.0                | 1.0                | 1.0                | 1.0                |

Low Water Chemicals

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**If a surfactant is used, where should the surfactant be applied?**

It is not feasible for BNSF to apply a surfactant while the loaded coal train is on rail property. Stopping loaded coal trains on the rail property would disrupt operations on the high volume PRB coal lines and could have a serious adverse impact on the reliability and efficiency of PRB operations. The most efficient and effective place to apply the surfactant is at the mine immediately after loading of coal into the rail car.

**Will all PRB coal shippers be subject to coal dust emission standards?**

Yes. BNSF is the operator of the Joint Line and is responsible for establishing operating rules that apply to all trains operating on the Joint Line. The coal dust emission standards set out in Item 100 and Item 101 of BNSF's Coal Rules publication referred to as Price List 6041-B have been issued as operating rules applicable to all trains operating on the Joint Line and on the Black Hills subdivision. BNSF anticipates establishing in the near future coal dust emission standards for coal trains operating over BNSF's Big Horn subdivision.

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**What will happen if a shipper's trains do not meet the coal dust emission standards?**

BNSF is hopeful and expects that shippers will comply with the standards and will further address any specific implementation steps as needed.

**Does BNSF intend to establish coal dust emission standards outside of the PRB?**

In addition to coal dust emission standards applicable to trains operating on the Joint Line, BNSF has established coal dust emission standards applicable to coal trains originating in the PRB and operating over BNSF's Black Hills subdivision. BNSF anticipates setting standards applicable to coal trains originating in the PRB and operating on the Big Horn subdivision in the near future. In addition, BNSF is continuing to study the impact of coal dust emissions in areas outside of the PRB.

**What information about coal dust emissions on particular trains is BNSF providing shippers?**

Since January 2009, shippers whose trains operate over the Joint Line and over BNSF's Black Hills subdivision have been receiving monthly reports on trains that exceed the coal dust emission levels specified in Items 100 and 101 of BNSF's Price List 6041-B. In addition, BNSF conducts random field audits of the loading profiles of coal cars and provides information to shippers and mines on cars that have a loading profile that deviates from the profile described in BNSF's coal dust emission standards.

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