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Office of the Secretary
Case Control Unit
STB Finance Docket No. 33407
Surface Transportation Board
1925 K Street, N.W.
Washington, DC 20423-0001

ENVIRONMENTAL
DOCUMENT

ATTENTION: Ms. Elaine K. Kaiser
Chief, Section of Environmental Analysis
Environmental Filing

**Re: Oral Comments on PRB Expansion DEIS
Presented to Federal Agencies at the Rapid City DEIS Hearing**

Dear Ms. Kaiser:

I am a trained Civil Engineer with Bachelor's and Master's Degrees in Civil Engineering from the Massachusetts Institute of Technology. My professional background includes 15 years as a Research Engineer in MIT's Transportation Systems Division, where I specialized in transportation and highway needs of developing countries. I have also analyzed railroad construction, maintenance and operations in Africa, Europe, and North America.

In my August 8, 1999, letter to STB, I pointed out the serious flaws in the Applicant's dismissal of using existing corridors between Wasta, SD, and Smithwick, SD, in order to avoid the unstable Pierre shale formations within the Cheyenne River valley. The DEIS continues to give inadequate attention to this alternative. In that analysis, I compared earthworks and other construction parameters along a reasonably rebuilt existing corridor to the proposed DM&E Alternative C. These calculations show that a rebuild of this section (with a bypass at Rapid City) can meet the geometric constraints of 1% maximum grades and 1 degree maximum curvature at reasonable cost, *i.e.*, that this "obvious" route is in fact a reasonable alternative under the terms of the National Environmental Policy Act (NEPA) and must be analyzed at the same level of detail as all other NEPA alternatives in the Environmental Impact Statement. In the Final EIS, the increases in trip costs associated with the additional miles along the rebuilt existing route must be compared against the likely costs from interruption of service along the Alternative C route caused by significant landslides or slumping banks.

In my October 9, 1999 letter to STB (mistakenly dated as September 9, 1999) I pointed out that DM&E has failed to meaningfully respond to the federal agencies explicit

requests regarding analysis of their existing corridor, including the "Wall Hill" climb out of the Cheyenne River Valley beginning near Wasta and ending at Wall, SD. The DEIS continues this non-analysis: "This realignment of the existing system was determined the only practical and feasible solution to the operational problems at Wall, considering the Cheyenne River, engineering requirements to cross Interstate 90, and straighten the overall segment." [DEIS at 2-16, footnote 7]. In my own analysis of the Wall Hill proposal, I found that the amount of earthworks necessary to exit the Cheyenne River Valley, and the unstable Pierre shale and badlands areas that are encountered along much of the proposed Alternative C alignment between Smithwick and Wall, SD, raise the question of whether it is desirable to enter the Cheyenne River Valley at all, just from an engineering cost perspective, let alone from an environmental impact perspective. These concerns must be fully addressed in the Final EIS.

In short, I have already pointed out to the STB that the Applicant's alternatives B and C within the Cheyenne River Valley, using the Applicant's proposed engineering constraints of 1 percent maximum grade and 1 degree maximum curvature, provides little transportation benefit over using the existing corridor between Wasta and Smithwick. Environmentally, staying out of the Cheyenne River Valley is definitely preferable. I have also pointed out that those same constraints preclude leaving the Cheyenne River Valley and climbing the Wall Hill without a considerable amount of tunneling. Rather than being the "only practical and feasible solution," the alignment proposed by the Applicant is infeasible under any meaningful consideration of environmental impacts. These two alternatives appear to be little more than "lines on a map" drawn to satisfy *pro forma* application requirements, rather than serious transportation proposals.

In order to investigate further why this application appears to be so nonsensical to so many people, let us look directly at the scenario that DM&E is suggesting will occur. I have tried to capture the essential transportation aspects in Figure 1 below, which shows in very rough schematic terms an annual demand to transport 400 million tons of coal from the Powder River Basin to midwestern utilities. At present, roughly 300 million tons per year is transported by the existing railroad facilities of BNSF and UP by roughly 120 trains per day, loaded plus unloaded. The Applicant proposes construction and reconstruction of a new heavy-haul rail line to carry an additional 100 million tons per year (or roughly a one-third expansion of capacity), on roughly 40 trains per day, loaded plus unloaded, at a preliminary construction cost of around \$1,400 million [STB 12/10/98 Transportation Decision at 40-41]. The Applicant presents no countermeasures that would be taken by BBNF or UP to protect their existing market shares.

This is an extremely unlikely scenario from a transportation standpoint, since the major factor affecting capacity of a unit-train system is the transportation "effectiveness" of the backhaul portion. The Applicant presumes that three firms will continue to operate two-way flow systems, with each empty train consuming capacity that could be used for additional loaded traffic. [Loaded train flows are shown by the dark arrows and empty train flows by the light arrows in Figure 1.] If empty backhauls could be moved to other tracks, the coal hauling capacity of the transport system would be effectively doubled.

This is much more likely to occur than the scenario proposed by the Applicant, and is shown schematically in Figure 2 below.

For comparison purposes, Figure 2 retains an overall transport demand of 400 million tons per year of PRB coal, but focuses on the equally important usage of the 3 million empty coal cars per year that are "produced" at the midwestern utilities by the process of transporting this coal. From a transportation standpoint, the "capacity" of BNSF and UP facilities can be doubled by having the empty coal cars and locomotives returned to the PRB by a one-directional flow over the Applicant's new rail line. All of the loaded trains would flow eastward over BNSF or UP mainlines, and all of the empty trains would return westward over the Applicant's new (light-rail) line. The total flows on BNSF and UP would be reduced from a total of 120 trains per day (loaded plus unloaded) to 80 trains per day (loaded only). The Applicant's projected flows would double from 40 trains per day (loaded plus unloaded) to 80 trains per day (unloaded only).

This second scenario is much more likely from a transportation standpoint, for the following reasons. First, the capacity of BNSF and UP could be increased by 50% and still meet the congestion levels experienced by the current mixed-flow regime, effectively raising PRB coal capacity to 600 million tons per year, without any additional investments by BNSF or UP. Second, the construction costs could be considerably reduced, since only a light-rail system would be needed (loaded coal cars weigh ten times or more than empty cars weigh). Thus, engineering constraints could also be relaxed, easily to 2 percent grades and 2 degrees of curvature, thereby eliminating many of the environmental impacts from the construction and reconstruction activities. Applicant's engineering objections to using the existing corridors between Wall and Smithwick would disappear, as would the construction problem on the "Wall Hill". A bypass a Pierre might also become feasible under these relaxed engineering constraints.

Using the per mile figures for "track rehabilitation" (\$457,000 per mile) and "bridge rehabilitation" (\$198,000 per mile) from the Transportation Decision [p. 41] and 15 percent engineering and contingency yields a "rebuild" cost of \$750,000 per mile. Increasing this figure by one-third for new construction would yield \$1 million per mile. [Note that these were the Applicant's figures for heavy-haul rebuild costs, and thus likely overestimate what would actually be needed]. Using 660 miles of reconstruction and 200 miles of new construction then yields a total cost of just under \$700 million for the one-way "light-rail" project construction costs.

From these figures, we can see that the "capacity" of the system could be increased by 300 million tons per year, as opposed to the Applicant's anticipated 100 million tons, and at half the cost, by rationalizing the PRB transport system to utilize a "loop" of one-way flows. It is my professional opinion that these overwhelming market efficiencies will override any preliminary proposal submitted by the Applicant, and the system will ultimately be operated in this "flow separated" manner. This doubled capacity of the PRB transport system goes a long way to explaining the deafening silence of the Applicant's alleged rail "competitors" for the PRB market.

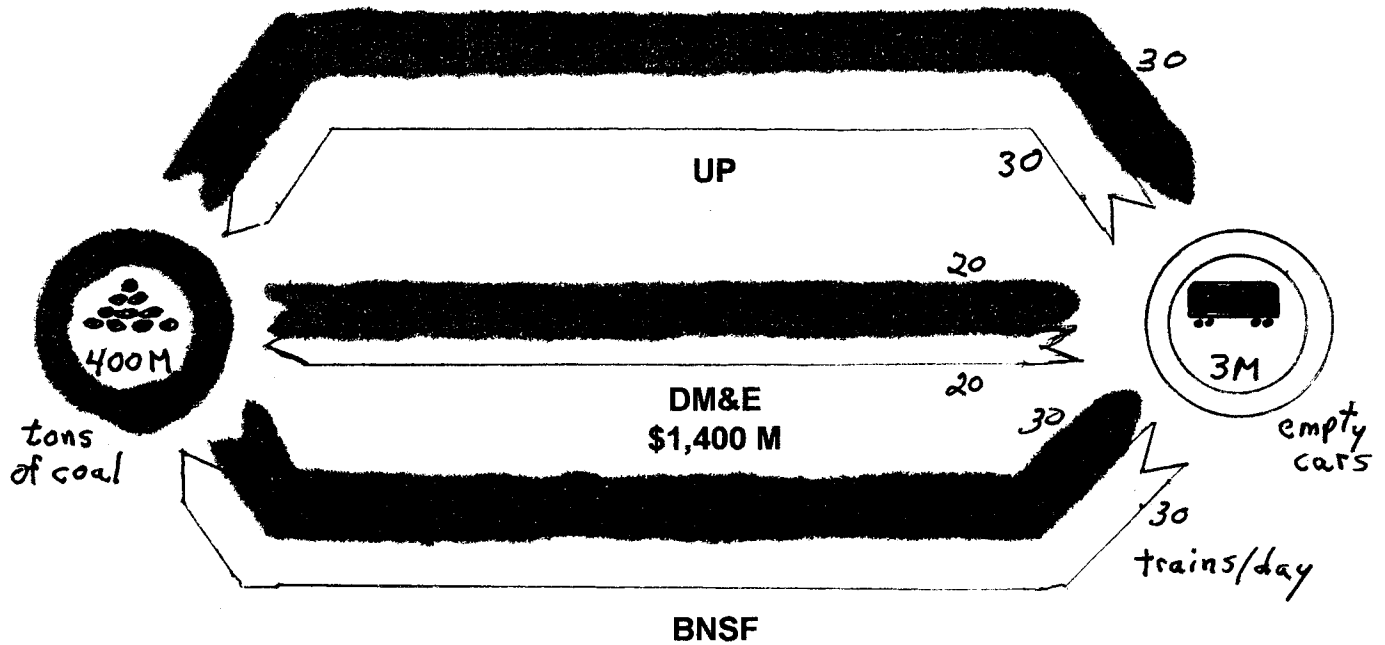


Figure1. The Applicant's scenario envisions DM&E ultimately achieving a 25% market share for PRB coal, handling about 100 million tons per year out of the total shipment of 400 million tons, at a projected construction cost of \$1,400 million. The railroads would operate exclusionary lines, with each line mixing loaded and unloaded trains moving in opposite directions, exacerbating congestion effects. Solid arrows indicate loaded flows; light arrows indicate unloaded flows.

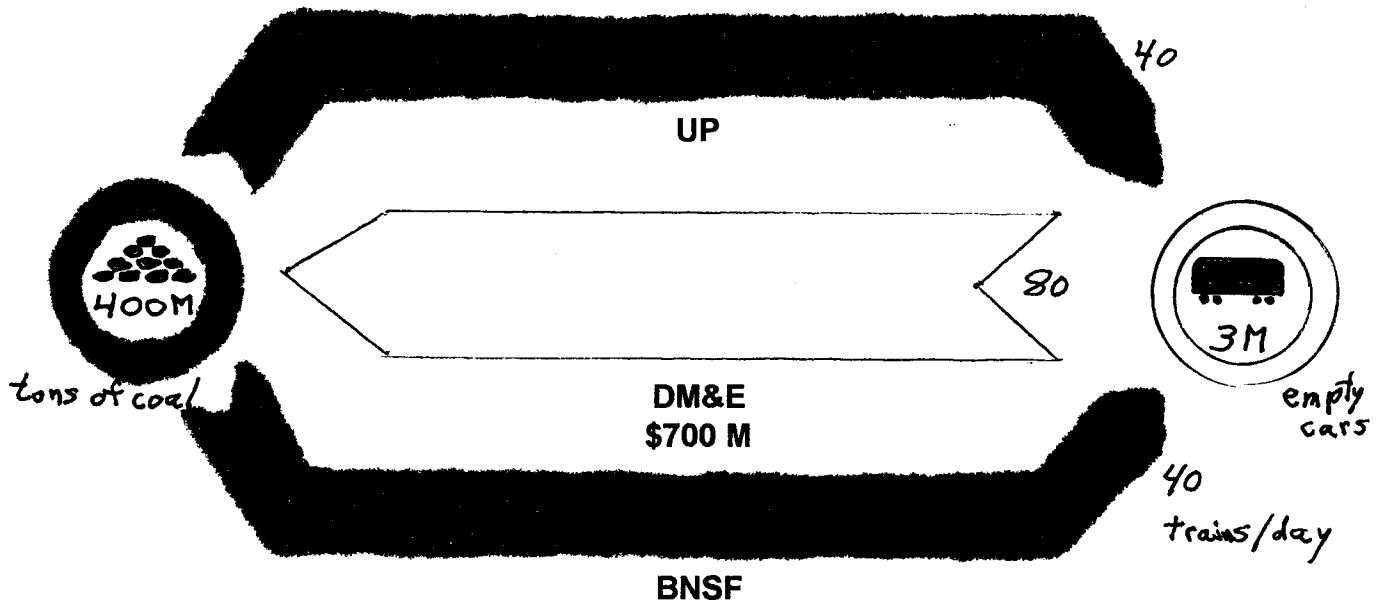


Figure 2. In a "separated flows" scenario, the DM&E track will be used to haul the empty coal trains back to the PRB mines for reloading, minimizing congestion impacts on the BNSF and UP mainline tracks. All loaded flows would be over the heavy-haul BNSF and UP mainlines. An increase in PRB capacity to 600 million tons per year could be achieved by using the "freed-up" mainline capacity for additional coal haulage, at a construction cost of under \$700 million. Solid arrows indicate loaded flows; light arrows indicate unloaded flows.

So why hasn't the Applicant proposed such a transportation alternative? There are at least three reasons. First, given the objections from impacted parties due to noise, vibration, and disturbance from the Applicant's proposed ultimate traffic level of 40 trains per day, those objections would be even louder at the prospect of 80 to 120 trains per day, even unloaded trains. Second, it is highly unlikely that Federal agency permits to cross public lands and waters would be forthcoming in what would be perceived as a highly inequitable balancing of the negative impacts of these coal-related flows (BNSF and UP get enhanced capacity and revenues, those along the Applicant's route get the penalties). And third and possibly most important, your own December 10, 1998, Transportation Decision could never have been issued to a system that would so clearly eliminate the existing users of the Applicant's decrepit railroad.

Given that the "separated flows" scenario achieves greater expansion of PRB capacity, and at lower cost, than the Applicant's proposed scenario, it must be regarded as a reasonably foreseeable operational outcome of granting this application in any form. The costs of construction and environmental impacts must be compared to expanding the BNSF and UP facilities to achieve a similar overall increase in effective PRB capacity. The increased noise and disturbance impacts of 80-120 trains per day must be addressed. The engineering feasibility of using existing corridors must be re-evaluated under a "light-rail" scenario sufficient to accomodate unloaded coal trains, such as 2 percent grades and 2 degrees of curvature. And the environmental justice implications, and likelihood of nasty materials such as garbage and toxics being attracted to these empty west-bound flows, must also be included in the Final EIS.

Sincerely,



Brian Brademeyer