Comments on Longview DEIS- Chapter 5.7: Coal Dust
Submitted by Daniel Jaffe, June 2016
Professor of Atmospheric Chemistry
University of Washington Bothell
Comments based primarily on our two published studies

1. Diesel particulate matter emission factors and air quality implications from in-service rail in Washington State, USA, by D.A. Jaffe, G. Hof, S. Malashanka, J. Putz, J. Thayer, J.L. Fry, B. Ayres and J.R. Pierce, in *Atmospheric Pollution Research* 5, 344–351, doi: 10.5094/APR.2014.040.
2. Diesel particulate matter and coal dust from trains in the Columbia River Gorge, Washington State, USA, by D.A. Jaffe, J. Putz, G. Hof, G. Hof, J. Hee, D.A. Lommers-Johnson, F. Gabela, J.L. Fry, B. Ayres, M. Kelp and M. Minsk, in *Atmospheric Pollution Research,* doi: 10.1016/j.apr.2015.04.004.

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1. The DEIS seems to imply that coal dust does not contribute to inhalable particulate matter that contributes to human health problems (eg PM2.5). This is clearly not the case. To quote from the DEIS Coal Dust fact sheet "The study found that coal dust particles from rail cars are typically large and fall close to the rail tracks." Our data, and the Cowlitz County data, clearly indicate that coal dust constitutes a range of particle sizes including particles smaller than 2.5 micrometers in diameter. The EIS needs to clearly indicate that coal dust includes inhalable PM2.5.
2. Our peer-reviewed and published scientific analysis (Jaffe et al 2015) clearly indicates that the surfactant coating does not always work. At present there is no information on the cause of these failures. As such, it is impossible to know if additional coating facility (e.g. requiring a facility in Pasco) will significantly reduce coal dust emissions. The EIS needs to address what are the causes for failure in the surfactant coating.
3. The DEIS describes an "acceptable level of dust deposition" in terms of g/m2/month. However, nowhere does the document describe an **acceptable level of human health impacts.** Our data demonstrates short-term PM2.5 concentrations of up to 232 ug/m3 due to coal trains. These exposures were documented on private property adjacent to rail lines in the Columbia River Gorge (Jaffe et al 2015). This was due to a large, clearly visible cloud of coal dust. While the health effects of such <u>short-term</u> exposure have not been extensively studied, some peer-reviewed published scientific papers have documented significant health effects from short-term exposure to PM2.5 (Salvi et al 1999; Pope et al 2015; Li et al 2016). These short-term exposures are not currently regulated by the federal clean air act. Nonetheless, the DEIS should set an acceptable "nuisance" level for public health. In order words, what are the limits for coal dust and PM2.5 exposure on private property, and what are the consequences for exceeding these limits? I propose that the EIS define an acceptable level of short term coal dust/PM2.5 exposure of no more than 50 ug/m3 in a 3-minute average one time per year and that a

monitoring program be put in place to ensure this limit is achieved. Our data in the Columbia River Gorge show that approximately 97% of all coal trains would meet this standard. This limit should apply to all private property that is adjacent to rail lines that transport coal.

4. The coal dust modeling (e.g. table 5.7.2) fails to incorporate any failure rate into the calculations. Our data show that the failure rate for moving trains is at least 5%. The contribution from these coal trains where the surfactant has been misapplied (or not applied at all) likely dwarf the emissions from all other trains.
5. The DEIS reports on one study down in Cowlitz County (pg 5.7-5 main document and 2.2-4 in technical supplement). There are a number of problems associated with this study. First, this study was likely influenced by an inherent bias due to the fact that the shipper knew the date, time and location of the tests. They can then utilize their best operating conditions to minimize diesel, coal dust and other PM impacts. This is not the same as a "blind" test, whereby the shipper is not notified of the date and location of the testing. In particular, a "blind" test will identify the true failure rate for the surfactant and true coal dust emissions, whereas the biased test will not identify the true failure rate. This study apparently never saw a coal train with a PM2.5 concentration greater than 22 ug/m3 (Figure 4), whereas we identified coal trains with large dust plumes and much higher PM2.5 concentrations of up to 232 ug/m3. This is likely due to the fact that the shipper was aware of the testing that was taking place.
6. <u>Despite point 5 above,</u> the data from the Cowlitz study clearly show that the dust suppression methods are much less than 100% effective. This is because the observed <u>concentrations are 4 times higher than the modeled concentrations, as shown in Figure 4 of the SEPA Coal Technical Report.</u> Models are useful to estimate many environmental situations, but they must be constrained and confirmed by observations. In this case, the model is clearly not reproducing the observed concentrations. This can only be explained if the modeled coal dust emissions are <u>much larger</u> than what is being put into this model. The Cowlitz County data, shown in Figure 4, indicate that the model is under-estimating the coal dust emissions by about a factor of four. This would imply that the actual coal dust emissions are four times greater than the modeled emissions. The DEIS cites a dust suppression effectiveness of 61%, whereas the data <u>indicate an effectiveness of only 25%.</u> Section 2 in the technical document ends with Figure 4 and does not discuss the implications of this large discrepancy between the model and observations. It is absolutely essential that the modeling be redone with the significantly higher, and correct, coal dust emissions. <u>Based on both the UW and Cowlitz County</u> studies, the data show much higher dust emissions than are accounted for by the modeling.
7. Based on these results, the modeling should be redone using two different approaches: First, the model should assume that 5% of the coal trains had no surfactant (equivalent to saying that the surfactant was incorrectly applied or otherwise ineffective). The model results should then be re-evaluated based on this assumed failure rate. Second, the

modeling should be redone with a coal dust emission factor that is four times larger. This would be consistent with the Cowlitz County data presented in Figure 4 of the SEPA Coal Technical Report. This is particularly important given that the trigger level for impacts (2 g/m2/day) are already exceeded for some receptor location (Table 5.7-7) or very close to the currently model estimates (1.88 g/m2/day, Table 5.7-3) and that human health impacts from short term exposure to high concentrations have been documented.

References for health effect from short term PM2.5 exposure:

Salvi et al. Acute inflammatory responses in the airways and peripheral blood after short-term exposure to diesel exhaust in healthy human volunteers. Amer. J Resp.Crit Care Medicine. 159(3), 702-709, 1999.

Li et al. Short-term Exposure to Ambient Fine Particulate Matter Increases Hospitalizations and Mortality in COPD A Systematic Review and Meta-analysis. Chest 149 (2),447-458, DOI: 10.1378/chest.15-0513, 2016.

Pope et al. Short-Term Exposure to Fine Particulate Matter Air Pollution Is Preferentially Associated With the Risk of ST-Segment Elevation Acute Coronary Events. J Amer Heart Assn. 4 (12), e002506m, DOI: 10.1161/JAHA.115.002506, 2015.