Comments of Dr. Bart Ostro. Former Chief of the Air Pollution Epidemiology Section, California Environmental Protection Agency (retired). Dr. Ostro was responsible for helping to develop the air pollution standards for fine particles (PM2.5) for California, the U.S. EPA and the World Health Organization and is the author of over 100 peer reviewed publications on the health effects of air pollution and heat waves.

RE: Comments on: Oakland Bulk and Oversized Terminal Air Quality & Human Health and Safety Assessment of Potential Coal Dust Emissions, prepared for: California Capital and Investment Group, HDR Engineering, September 2015

1. Page 5 the consultants state there will be little erosion of coal. However, their citation refers to field testing of dust from coal piles, NOT from moving trains which will likely produce a distinctly different level of emissions. In addition, the erosion potential will be impacted at the West Oakland location due to the winds that are often experienced there. For example, wind analysis from the Bay Area Air Quality Management District shows that 100% of the winds in the summertime, when people spend the greatest amount of time outdoors, are from the West. This means that dust from the rail operations, including the train hauling itself, will blow directly into Oakland residential areas, particularly West Oakland. In the winter time, still about 70% of the time, the wind is from the West. In addition, the data indicate that many days have wind speed above 10 mph. (Eric Fujita and Campbell, West Oakland Monitoring Report, DRI, 2010). Furthermore, actual empirical evidence of fine particle concentrations at the delivery site (NOT at the mines which the contractors state is the only place that will be impacted by erosion) shows significant increase in concentrations due to coal trains. This issue is discussed in point 5d below.

2. Page 5. CCIG consultants state: “moving rail cars would emit negligible quantities of coal dust in the Oakland area because of load profiling and topping measures.” To support this statement they refer to the lack of erosion (again suggesting incorrectly that all erosion will occur near the mines), discussed above, and to tests that shows an 85% reduction in coal dust from the control strategies undertaken. Several points here: (1) The 85% reduction is based on field tests and trials conducted by BNSF and Union Pacific in limited circumstances. It is not based on real world practices or data; (2) the surface sprays used to cover the coal tend to degrade over time and for the new marine terminal at the former Oakland Army Base we are talking about an 800
mile trip from Utah. In the Powder River coal transport to the West Coast, the train company needed to add an additional surface spray facility along the route from Montana. It is not clear if an added facility is planned in this case and it is not mentioned in the consultant report; (3) there is no mandate for this control, and compliance, especially over time, is questionable; and (4) even after an 85% reduction, there would still be significant increases in fine particulate air pollution for Oakland residents. Representatives from BNSF indicated that there would be an average erosion of 1.6 lbs of coal dust per car per mile. Using simple assumptions, a daily train of 115 cars for a year, for the 12 miles that the train would pass through Oakland would result in a deposition of

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1.6 \text{ lbs/car-mile} \times 365 \text{ days} \times 115 \text{ cars} \times 12 \text{ miles} \times 2000 \text{ (pounds in a ton)} = 400 \text{ tons a year of coal dust deposited in Oakland annually}
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and 100 tons a year in West Oakland. Even with 85% control, if it actually occurs, this would still leave 60 tons of coal dust a year in Oakland and approximately 15 tons per year in West Oakland. **Hardly a “negligible” amount.**

3. Page 6. The consultants add, almost as an aside, that the trains will also be covered. However, there is no detail on this and to our knowledge no existing practice where this is currently employed, and certainly no regulatory mandate for it. Again, **compliance is an issue** since this would add costs to the train operation and is currently not actively used. We contacted two companies (CoalCap and Rush-Co) that are now developing prototypes of covered cars. They have only been tested on a limited basis and are still engaged in development. It is unclear when, if ever, these would be available commercially.

4. Page 11. The CCI\textsuperscript{G} consultants make a statement in section IV that the transport operations will not harm public health. They state that “Coal and coal dust in itself is not specifically regulated or defined as a hazardous material by USEPA.” While this is true, some of the coal dust will be a fine particulate which is subject to federal and state outdoor air pollution standards that are discussed below.
5a. **WHY are fine particles important?** Airborne fine particles are often called PM2.5; these are particles that are 2.5 microns or less in diameter. By contrast, a human hair is approximately 70 microns. PM2.5 from coal dust are important since it can be inhaled deep in the lungs. Studies from epidemiologists and cardiologists have demonstrated in peer reviewed journals that there is a clear causal relationship between both very short (a day or multiple days) and longer-term (several months to years) exposure to PM 2.5 and a wide range of adverse health outcomes (Brook et al 2010). Studies from around the world and from California demonstrate that PM2.5 is associated with respiratory symptoms, school and work loss, asthma exacerbation, emergency room visits, non-fatal heart attacks, adverse birth outcomes (premature births, low birth weight), hospital admissions, and death from cardiovascular disease. The populations at greatest particular risk (though other groups are susceptible) include children, asthmatics and older individuals with pre-existing cardiovascular or respiratory disease. In California, these peer reviewed studies showing some of these health effects include those by Ostro et al. 2006, 2009; Malig and Ostro (2009), Green et al. (2009) and Malig et al. (2013).

5b. PM2.5 has been determined by the World Health Organization (WHO) to have the greatest worldwide impacts of any environmental exposure with an estimated 3 million deaths per year. (Lim et al, 2012). The California Air Resources Board estimates for California range from 10 to 30 thousand per year depending on the assumptions in the analysis and the air standard used.

5c. While specific outdoor air standards have been established for PM2.5, institutions including California EPA, USEPA and WHO have specified there is no clear cut safe level for these effects. This means that every exposure adds to the likelihood of an adverse health outcome. Thus, even in areas where the standard is being attained, additional exposure to coal dust is likely to impact health, especially in a susceptible population.

5d. In **one of the few actual studies** conducted on this issue, scientists at the University of Washington examined the contribution to PM2.5 from coal versus freight trains, close to the destination site (i.e., NOT close to the mines) (Jaffe et al., 2014; 2015). In their peer reviewed publication, they reported that the average peak in near-by concentrations of PM2.5 of coal trains were twice that of freight, specifically 21 versus 11 micrograms per cubic meter. In addition, they reported several events with concentrations greater than 75 micrograms with concentrations
up to 230 micrograms. **Thus, one would logically expect very high peaks of PM2.5 from coal dust, at concentrations that could cause health effects.**

6. Page 11, Section A. The CCIG consultants report the results of a coal dust study conducted by the Surface Transportation Board (STB) regarding a proposed rail line in Montana (also known as the Tongue River Rail Project). Based on a modeling exercise they report that incremental concentrations of airborne coal dust from train cars are expected to be below the standards set in the National Ambient Air Quality Standards (NAAQS) and the Montana Ambient Air Quality Standards (Montana AAQS) to protect human health. I believe they wish the reader to infer that therefore, the proposed project in Oakland will also not impact public health. However, there are major differences between these two sites. Based on the latest available information, the two major towns in rural Montana, Colstrip and Ashland, that are impacted by the railroad have populations of 2200 and 400, respectively. There is obviously very little urban residential activity to produce pollution in this area such as traffic, restaurant cooking, and biomass burning. In fact, based on a letter from the governor of Montana, the annual average concentrations of fine particles in Rosebud and Powder River Counties, the two counties immediately impacted by the railroad are 5.5 and 6.7 micrograms per cubic meter (the latter is the standard method for measuring fine particles concentrations). (Letter from Steve Bullock, Governor to Shaun McGrath, Regional Administrator, USEPA, “Montana 2012 Revised Annual PM2.5 NAAQS Initial Designation,” Dec 2, 2013). This is a very low concentration, but not unexpected for this very rural area. In addition, the STB report says nothing about impacted communities at the final delivery point.

In contrast, obviously Oakland is part of a major metropolitan area with multiple sources of fine particulate pollution. Air pollution measurements have been taken in West Oakland by the Desert Research Institute, a firm known internationally for its work on measuring exposures. Their analysis indicates that, based on sampling conducted at several residential sites in the West Oakland community, the annual averages of PM2.5 were above 11 micrograms per cubic meter (Fujita and Campbell, West Oakland Monitoring Report to the BAAQMD, DRI, 2010). Another monitoring study showed concentrations in West Oakland of 15 to 40 micrograms per cubic meter (Bui et al. Ground Level Monitoring of Particulate Matter in West Oakland). **Thus, the**
current levels of PM2.5 in West Oakland are roughly twice that of the Montana train site used by the consultants. As such, the expected contribution of coal dust would most likely put them in violation of both the state and federal averages of 12 micrograms per cubic meter. In addition, as explained earlier, there is a possibility that they would exceed the 24-hour standard for PM2.5. It is also important to note that West Oakland is heavily impacted by diesel particles, which are very small particles. Several studies have shown that these particles (which are similar to the coal dust particles) are up to 10 times more toxic than generic PM2.5 (Ostro et al., 2014).

**Conclusion** Based on the above information, coupled with the lack of a recognized safe level for exposure to PM2.5, it is naive and reckless to state that the public health will not be impacted by the coal-bearing trains. Further it is inappropriate to use the study in Montana to infer the consequences of coal transport in the Oakland corridor. Finally, comments from the Environmental Impact Statement for the Montana project suggest that only 30 percent of shippers comply with the rule to properly spray and control dust. (Online Public Meeting for the Draft EIS for the Proposed Tongue River Railroad, June 17, 2015). Based on all available information, empirical data from Washington State, and a common sense approach to the issue, it is very likely that the proposed coal trains would significantly impact the health of residents of West Oakland and Oakland, in general.

References

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