OREGON PSR PHYSICIANS FOR SOCIAL RESPONSIBILITY

November 17, 2013

Via Website Comment Form http://millenniumbulkeiswa.gov/submit-comments.html

Millennium Bulk Terminals EIS

c/o ICF International

710 Second Avenue, Suite 550

Seattle, WA 98104

Re: Scoping Comments on Proposed Millennium Bulk Terminals Longview

To Whom It May Concern:

Thank you for the opportunity to comment on the proposed Millennium Bulk Terminals Longview (MBTL) project. This is one of two formal comment letters Oregon Physicians for Social Responsibility will submit to you on this matter.

We include (in text and by attachment) a document for your consideration during the required scoping comment period for the Environmental Impact Statement. This document closely mirrors one submitted by the group known as "Whatcom Docs" during the scoping comment period for the proposed Gateway Pacific Terminal, with their permission.

Potential Health Impacts of Millennium Bulk Terminals Longview (MBTL)

Physicians Request a Comprehensive Health Impact Assessment (HIA) Be Included in the EIS

A direct impact of the proposed coal shipping terminal at Longview would be sixteen 1.5 mile long trains traveling across the state and through our communities each day, and 1460 additional ship trips in our waterways each year. This will result in increased airborne pollutants from diesel engines and coal dust. The increased train traffic will also cause significant delays at rail crossings, increased risk of vehicle and pedestrian injuries along the tracks, and increased noise pollution. As a group of Washington and Oregon physicians, we are concerned about the health impacts of this proposal.

As physicians, we feel the risks to human health from massive coal shipments across our state and through our communities are numerous and complex. We respectfully request a comprehensive **Health Impact Assessment (HIA)** addressing these issues along the entire rail and shipping corridor from the mines to the Pacific Ocean. **In addition, because the MBTL proposal is not isolated to Longview, but is being considered along with multiple other ports with associated cumulative impacts, we request that a comprehensive HIA (to encompass all of the ports in the Pacific Northwest) be performed to best elucidate the impacts on human health.**

We also request that the HIA include a public scoping process.

Further supporting documentation and EIS requests follow.

I. Health Impacts of Diesel Particulate Matter (DPM)

One of the largest potential health impacts of the Millennium Bulk Terminals Longview lies in the increase in air pollution resulting from diesel locomotive emissions all along the transportation corridor, from the Powder River Basin to Longview, and the diesel emissions from the ships transporting the coal through Columbia River to the mouth of Pacific Ocean.

The effects of air pollution are not hypothetical, but real and measurable. Many studies, some of which were conducted in the Seattle area, show significant health effects of exposure to everyday airborne pollutant levels that are below national U.S. Environment Protection Agency (EPA) guidelines. The data show a linear effect with no specific “safe threshold.” Recognizing this, the EPA has recently taken steps to enact more stringent standards.

The conclusion that airborne pollutants pose a significant and measurable health risk was also found by the American Lung Association, in their review, “State of the Air 2012”, and by the American Heart Association, in their 2011 review, “Particulate Matter Air Pollution and Cardiovascular Disease.”

Diesel *particulate* emissions are of special concern, particularly the size fraction up to 2.5 microns, known as PM2.5. This size of particle is able to be respired deep into the lungs. PM2.5 from all sources has been implicated in numerous diseases ranging from cardiopulmonary disease to cognitive decline to cancer. The deleterious impact on human health is incontrovertible (WA DOE 2008, California Air Resources Board 1998, and many other studies). Diesel engines are of particular concern as sources of particulate matter, as they typically produce PM2.5 at a rate about 20-times greater than from gasoline engines.

Health Impacts of DPM: Cancer

Studies show an association between exposure to diesel exhaust and lung cancer (Bhatia, 1998), as well as cancers of the bladder and soft tissues (Guo et al., 2004). Several extensive and detailed reviews have been conducted on the body of literature relating long-term exposure to diesel exhaust particles and lung cancer (California EPA, 1998; USEPA, 2002; Cohen and Nikula, 1999). In addition, over 40 studies conducted among those populations exposed to diesel exhaust have found increased rates of lung cancer associated with diesel exhaust particles exposure (as cited in Cohen and Nikula, 1999). Occupational studies conducted in railroad workers and truck drivers have consistently found increased lung cancer risk, even after adjusting for comorbidities such as smoking (Bofetta, 2001). The impact of DPM on cancer risk must be considered in the decision making process for the MBTL.

Health Impacts of DPM: Cardiac and Pulmonary

Although cancer risk is understandably of great concern to the public, cardiac and respiratory effects of diesel exposure have an even larger public health impact because they cause death and illness for a greater number of people. DPM can exacerbate asthma and emphysema, induce heart attacks and strokes, and has been associated with congenital heart abnormalities. According to a landmark study by Pope et al (2002), each 10 ug/m3 increase in DPM was associated with a 6% increase in cardiopulmonary mortality. In a follow-up to this study, Pope et al (2004) demonstrated that their previously observed increase in cardiopulmonary mortality was largely driven by increases in cardiovascular, as opposed to pulmonary mortality. In this follow-up study, a 10 ug/m3 increase in PM2.5 was associated with a 12% increase in mortality due to ‘all cardiovascular disease plus diabetes’ and an 18% increase in mortality due to ‘ischemic heart disease’. Further epidemiological investigations have revealed that these estimates are likely largely underestimating the effect of PM2.5 due to inadequate exposure characterization. Published in the *New England Journal of Medicine*, Miller et al. (2007) utilized a novel exposure characterization method and reported from the Women’s Health Study that a 10 ug/m3 increase in PM2.5 was associated with a 76% increase in death due to cardiovascular disease. To further highlight the impact of PM2.5 on public health, the ‘Global Burden of Disease’ report recently published in *Lancet* reported ambient PM2.5 as the #9 cause of disease world-wide, and the #14 cause of disease in North America (Lim et al. 2013) in the year 2010.

It is well understood that ambient air pollution and fine ambient particulate matter strongly contribute to disease burden and death, but it has been less clear as to how much an individual's living proximity to a major roadway or direct PM2.5 source influences health risks. Due to research led by those at the University of Washington, it is becoming clearer that an individual's exposure to PM2.5 is dependent on where he/she lives and works and that this strongly influences health outcomes. Van Hee et al. (2009) demonstrated that living close to a major roadway was a strongly associated with left ventricular hypertrophy, an important marker of cardiovascular disease and a strong predictor of heart failure and mortality. Additional work by this group has demonstrated an individual's exposure to PM2.5 impairs how well blood vessels dilate and how well the heart functions, providing a basis for our understanding of previously observed increases in mortality (Van Hee et al. 2011, Krishnan et al. 2012).

There are very specific physiological effects with DPM exposure. A very recent study by Cosselman et al (2012) showed that diesel exhaust exposure, to healthy human volunteers, rapidly increases systolic blood pressure (SBP). In their study, SBP increased within 15 minutes of being exposed to dilute diesel exhaust and reached a maximum increase in SBP within 1 hr. Additional work utilizing controlled diesel exhaust exposures to human volunteers has revealed that these acute exposures results in an impairment in blood vessel function and alters blood coagulability, both of which are extremely deleterious effects and increase the risk of acute cardiovascular events such as heart attack and stroke (Mills et al. 2005, 2007, and Törnqvist et al. 2007). Fitting with these findings, epidemiological investigations have consistently demonstrated that acute increases in PM2.5 result in an increased risk of heart attack (Peters et al. 2001).

In addition to cardiovascular risk, cerebrovascular effects and risk of stroke associated with PM2.5 exposure has been investigated. Research published in the Archives of Internal Medicine (2012) examines, for the first time, the risk of acute, short term exposures to PM2.5 as a key factor in triggering stroke, often within hours of exposure. The study found a linear relationship between PM2.5 level and stroke risk even when the exposure was well below the EPA daily exposure limit. Overall, the risk of ischemic stroke was 34 % higher on days when the PM2.5 level was on the higher range of "moderate" exposures (15-40 ug/m3), as opposed to days when pollutants are lower than 15 ug/m3. This is an unprecedented finding, and points to the acute danger of even short term exposures to levels of particulate pollution previously thought "safe."

Studies conducted at Seattle Children's Hospital show that air pollution leads to asthma exacerbations, increased ER visits, and increased hospitalization, at levels that currently exist in Seattle. A study in California shows that about half of the economic costs of asthma can be attributed to air pollution, costing society millions of dollars per year. Thus, it is emphasized that additional DPM exposure adds to an existing problem.

Health Impacts of DPM: Associated Toxins

While hundreds of different airborne toxins may be present in the gas phase of diesel exhaust, some of the most commonly identified are acrolein, acetaldehyde, formaldehyde, benzene, 1,3-butadiene, and polycyclic aromatic hydrocarbons (PAHs). **The human health impact of all of these associated toxins will be important to study in detail**:

- Formaldehyde is carcinogenic to humans. It is also a highly reactive substance that can be irritating to the nose, eyes, skin, throat and lungs at fairly low levels of chronic exposure.

- Benzene is considered to be carcinogenic to humans. Chronic exposure to benzene leads primarily to disorders of the blood.

- 1,3-Butadiene is linked to cancers of the blood and lymph systems, including leukemia. It has also been linked to disorders of the heart, blood and lungs, and to reproductive and developmental effects.

- Some Polycyclic Aromatic Hydrocarbons are carcinogenic to humans. Because this group of compounds covers a wide range of physical-chemical properties, some PAH are found in air on particles while others are gaseous. PAH of both forms may be deposited in the lung.

Vulnerable groups who are especially at risk from air pollution include children, pregnant women, and the elderly.

Recommendations

Given that there is currently no federal regulation on DPM, it is incumbent upon the decision makers in this process to apply the *best available science* in determining the health impacts of the MBTL. The Washington Department of Ecology summarized the current state of the science in a white paper entitled "Concerns about the Adverse Health Effects of Diesel Engine Emissions" (2008). This paper recommends the adoption of the risk assessment tools developed by the California EPA's Office of Environmental Health and Hazard Assessment, and the US EPA Integrated Risk Information System, for carcinogenic and non-carcinogenic risk based DPM concentration levels. **We recommend the use of these risk assessment tools in investigating the potential impact of the MBTL.** (See health risk assessment guidance from California's Office of Environmental Health and Hazard Assessment at http://www.oehha.ca.gov/pdf/HRSguide2001.pdf)

A study of air toxins in the Tacoma and Seattle area was recently completed using these risk assessment tools (October 2010). Among many other findings, this study demonstrated that DPM contributed *over 70%* of the potential airborne pollutant cancer risk in the Seattle area.

This study did not, however, quantify the risks spatially, relative to a specific source such as the railway corridor or the terminal operation. The highest exposure risks of DPM from the MBTL will occur to populations in close proximity to the tracks, terminal, and shipping lanes. **Thus, we recommend that the near source health effects be quantified spatially all along the transportation corridor, not just for the terminal site. This will necessarily include the railway corridor, as well as the emissions from marine vessels.**

Modeling should use either the California Office of Environmental Health Hazard Assessment tools and modeling protocol or the EPA Air Toxics Community Multiscale Air Quality Model to predict multiple pollutant effects on the affected communities. The modeling protocol should be approved by the Washington Department of Ecology and the EPA. The modeling should be performed by consultants familiar with the models and with interpreting the results of the models.

If mitigation measures, pollution control devices, ultra low sulfur fuel specifications, or late model diesel locomotive emission factors are used in the emissions estimates and models, those assumptions should be listed as mitigation required in the Draft and Final EIS.

The Columbia Basin and Portland/Vancouver metropolitan areas experience temperature inversions, which can dramatically increase pollutant concentrations. **Thus, the analysis must include not only effects of pollutants near the transportation corridor under normal weather conditions, but also under temperature inversion conditions.**

<u>Summary</u>

A direct result of the MBTL will be a substantial increase in airborne pollutant emissions from train and marine traffic from the Powder River Basin, all through the rail transportation corridor, at the terminal site, and on and near the Columbia River. If MBTL is not built, these impacts will not occur. Thus, the impacts must be quantified through the entire region impacted by this activity, not just at the terminal site.

Because of the health impacts that will be a direct result of the MBTL project, we respectfully request that the EIS include a Health Impact Assessment that addresses the following questions:

1. How much DPM and toxins (detailed above) will people be exposed at 50 feet, 100 ft, 200 ft, etc. up to 2 miles from the tracks when a train goes by? We request this data to be shown in an easy-to-understand format, including maps with "pollution contours" (isopleths).

2. How much DPM and toxins (detailed above) will result from the ships, including ships that are at anchor (staging), at the dock, or in transit?
3. What will the impact of temperature inversion weather conditions be on air pollutants?
4. How many people live within 50 ft, 100 ft, 200 ft, 500 ft, 1000 ft, 1 mile, and 2 miles along the entire transportation route from Powder River Basin to Longview and from there to the mouth of the Columbia River, including current and projected populations?
5. How many of the people living, going to school, or working within the distances above are children, including current and projected populations? Elderly? Have any form of pulmonary or cardiovascular disease?
6. How many increased asthma attacks, ER visits, and hospitalizations will result, including current and projected populations, and including under temperature inversion conditions? What is the economic cost? Who pays for the costs?
7. How many increased strokes will result, including current and projected populations, and including under temperature inversion conditions? What is the economic cost? Who pays for the costs?
8. How many increased myocardial infarctions (heart attacks) will result, including current and projected populations, and including under temperature inversion conditions? What is the economic cost? Who pays for the costs?
9. How many COPD exacerbations will result, including current and projected populations, and including under temperature inversion conditions? What is the economic cost? Who pays for the costs?
10. How much cancer will result, including current and projected populations? What is the economic cost? Who pays for the costs?
11. How much acrolein, acetaldehyde, formaldehyde, heavy metals (including but not limited to mercury, lead, and arsenic), 1,3-Butadiene, polycyclic aromatic hydrocarbons, or other toxins will be deposited cumulatively? This should be analyzed in a cumulative fashion, (i.e. additive) over the next 50 years (the operating life of the terminal).
12. What are the effects of chronic exposure of the above compounds on: Neonatal and childhood development? Blood and lymphatic systems? Respiratory system? Cardiovascular system? Reproduction? Cancer? What are the economic costs of these? Who pays the cost?
13. What is the cost of cleanup of the cumulative environmental contaminants? How effective is the cleanup? Who pays the cost?
14. Medical research comes forth at an intense pace. When new health impacts are inevitably identified or quantified, how can the public be assured that their health will be weighed in the balance of ongoing risks/benefits to MBTL operations?

II. Health Impacts of Coal Dust

The amount of coal dust that escapes from Powder River Basin coal trains has been estimated by Burlington Northern Santa Fe (BNSF) railroad to be from 500 pounds to 1 ton per car, or up to 3% of transported coal (BNSF, 2011). A study on a West Virginia rail line, transporting bituminous coal similar to the coal from the Powder River Basin, showed a similar loss of coal dust of up to a pound of coal per mile per car. (Simpson Weather Associates,1993). BNSF reports that escaped coal dust on the tracks can increase risk for derailments. Visible coal dust can be a costly pollutant requiring frequent cleaning for businesses and residences along a rail line or near a coal terminal as documented in a study from British Columbia (Cope et al, 1994).

Health Impacts of Coal Dust: Environmental Contamination

Deposition of coal from transport spills and dust may lead to contamination of soil, fresh water sources and the marine environment. Coal contains arsenic and heavy metals such as lead, mercury, boron, chromium, cadmium, and mercury (see summary contaminants in coal in Gottlieb et al. 2010). Contamination of farmland, animal pasture, and especially fisheries can impact human health. Arsenic from coal dust can persist in soil for years and has been shown to be a pollutant originating from a coal shipping terminal (Bounds and Johannesson, 2007). Arsenic concentrates in food crops such as apples and rice and is associated with increased rates of skin, bladder and lung cancers, cardiovascular and lung disease.

Because of the negative effects of mercury on neurologic development, pregnant women and young children are advised to limit their consumption of certain kinds of fish with increased mercury content (FDA/EPA Consumer Advisory, 2004). While mercury in coal dust is less biologically active before it is burned, mercury from coal burned in China is carried in the air across the Pacific Ocean to the west coast of the United States and across the country. Fourteen percent of the mercury in the Great Lakes originates in China (National Oceanic and Atmospheric Administration, 2011) and a larger percentage of the mercury in Lake Whatcom originates from coal burned in China.

Health Impacts of Coal Dust: Airborne Dust

Airborne coal particles pose a potential health risk to workers and to people in communities near railroad tracks, as well as near the mines and the proposed export terminal. Health risks of airborne coal dust to coal miners have been well documented to cause lung disease, ranging from severe pneumoconiosis to chronic bronchitis and exacerbations of asthma (Hathaway, et al. 1991).
While pneumoconiosis has only been conclusively associated with intense exposure, there is evidence that lower levels of respirable coal dust may also

cause lung disease. A recent study (Wade et al. 2010) examined miners who developed lung disease even while exposed to currently legal and well-regulated levels of coal dust. Animal studies (Vincent et al 1987) have examined the pulmonary effects throughout a wide range of coal dust exposures. They show that pulmonary clearance mechanisms tend to sequester the dust in lymphatic tissue and the interstitial space between alveoli. This inhibits further clearance mechanisms and facilitates the inflammatory cascade in the lung tissue.   In addition, the synergistic effects of respirable coal dust with other pollutants such as diesel particulate matter may accelerate lung damage beyond that which might be predicted by the coal mine epidemiologic data (Karagianes et al, 1981).

It should also be emphasized that children are not "little adults" and are thus more vulnerable to the health effects of environmental contaminants. Children eat more, breath more, and drink more per body weight than adults, and therefore receive a greater exposure and dose of any material. In addition, children have unique behaviors such as hand to mouth actions that increase exposure to contaminants. Developing organ systems (including nervous systems) are more vulnerable to adverse effects.

Because airborne coal dust exposure and environmental contamination is a direct impact of MBTL, we respectfully request that the EIS include a Health Impact Assessment that would address the following questions:

1. How much coal dust from the mining and transportation of coal can be expected along each section of the transportation corridor from the Powder River Basin to the proposed terminal and then to the mouth of the Columbia River?
2. How much accumulation will result after 50 years of transport (the operating life of the terminal)?
3. How many children and adults can be expected to have increased risk of asthma and other respiratory diseases, including current and projected populations?
4. How many coal train derailments can be expected along the rail corridor per year of operation of the proposed export terminal?
5. What will be the effect of contamination from coal dust and spills on farm land along the rail corridor?
6. What will be the effect of contamination from coal dust and spills on grazing animals used for human consumption?
7. What will be the effect of contamination from coal dust and spills on fresh water supplies for humans and animals?
8. What will be the effect of contamination from coal dust and spills on marine habitat for fish and other seafood?

9. What is the cost of cleanup of the cumulative environmental contaminants? How effective is the cleanup? Who pays the cost?
10. How many people can be expected to be affected by the increased exposure to mercury and other heavy metal contaminants of coal, such as by cancer, including current and projected populations?
11. Medical research comes forth at an intense pace. When new health impacts are inevitably identified or quantified, how can the public be assured that their health will be weighed in the balance of ongoing risks/benefits to MBTL operations?
12. What is the loss of coal dust from residual dust still on the cars on the return journey back to the Powder River Basin (so called "carryback coal")? How much of the "carryback coal" is expect to be lost in Cowlitz County in particular? If coal dust is, as is claimed by the proponents of the project, a near mine issue, is the terminal itself considered similar to a near mine site, with the coal lost from loose residual coal matter still on the rail cars from which most of the coal has just been shaken loose and dumped at the terminal site?

III. Health Impacts of Noise Pollution

Noise pollution is a growing health concern in this country and around the world. The World Health Organization has recognized it as a major threat to human health and well-being. Some of the well-documented adverse health effects include:

Health Impacts of Noise: Cardiovascular Disease:

In adults, both short-term and long-term adverse health effects have been documented, including increased blood pressure, increased heart rate, vasoconstriction, elevated stress hormones such as epinephrine and cortisol, arrhythmias, ischemic heart disease, and strokes. Increased stress-related hormones and elevated blood pressures have especially been seen in children with lower academic achievement. (Selander J 2009; Sorensen M et al., 2012; Sorensen M et al. #2, 2012; Sorensen M et al., 2011; Willich SN et al. 2006)

Health Impacts of Noise: Cognitive Impairment in Children:

Children exposed to increased noise have shown lower academic achievement in various forms including long term memory, reading comprehension, learning, problem solving, concentration, social and emotional development, and motivation. (Clark, C et al. 2012; Cohen, S. et al 1980; Evans GW 2003; Evans

GW and SJ Lepore, 1993; Evans GW and L Maxwell, 1997; Haines MM et. al. 2001; Haines MM et al #2, 2001; Hygge S et al. 2002; Stansfeld SA at el. 2005)

<u>Health Impacts of Noise: Sleep Disturbance:</u>

Noise can have both auditory and non-auditory deleterious effects on human health. Auditory effects include delay in falling asleep, frequent night time awakenings, alteration in sleep stages with reduction of REM sleep, and decreased depth of sleep. Non-auditory effects including increased blood pressure, increased heart rate, vasoconstriction, changes in respiration, and arrhythmia continue to have deleterious effects on human health even after the subject has acclimated to the noise. Decreased alertness from sleep disturbance is associated with an increased rate of accidents, injuries and premature death.

Studies have shown that noise >55 dB (night, outside level) is associated with sleep disturbance, that railway noise has greater impacts than road noise, and that even a single railway noise event significantly decreases REM sleep. **Hundreds of thousands of people along the transportation route will likely experience sleep disruption multiple times through the night as a direct result of MBTL.** (Aasvang et al, 2011; Brink et al, 2011; Carter NL 1996; Chang et al., 2012; Clark C. et al 2012; Halonen JI et al 2012; Hong J et al. 2010; Hume KI 2011)

<u>Health Impacts of Noise: Mental Health:</u>

Increased noise is known to accelerate and intensify development of latent mental health disorders including depression, mental instability, neurosis, hysteria, and psychosis. It is also a major environmental cause of annoyance leading to diminished quality of life (Evans GW at al, 1995; Fidell S et al 1991; Haines MM et. al. 2001; Haines MM et. al. #2, 2001).

Coal trains produce significantly greater noise and vibration than other trains: longer trains means more prolonged noise, greater weight means increased vibrations and more wheel squeak noise, and more locomotives per train are required resulting in more engine noise. Indeed, people can tell whether it is a coal train or not without looking at it, and simply based on the noise and vibration they experience. **Thus, evaluation of the noise impact of MBTL must account for the fact that these would be coal trains and not passenger or conventional freight trains.**

Like many of the health concerns, the noise of coal trains would represent an increase to an existing health problem. A person woken from sleep every hour -- as would be expected when the MBTL is at full operation, represents a different order of magnitude of adverse health impacts than a person woken or otherwise disturbed once or twice a night from existing train traffic. The train traffic directly impacts multiple dense residential areas along the entire rail line.

Because of the health impacts that will be a direct result of the MBTL terminal, we respectfully request that the EIS include a Health Impact Assessment that addresses the following questions:

1. How loud are train engines? Squeaking wheels? Whistle blasts? How loud are they at 50 feet, 100 ft, 200 ft, etc. up to 2 miles from the tracks? We request this data to be shown in an easy-to-understand format, including maps with "sound contours" (noise isopleths).
2. How much vibration does a coal train produce? How intense is this at 50 feet, 100 ft, 200 ft, etc. up to 2 miles from the tracks?
3. How many people live within 50 ft, 100 ft, 200 ft, 500 ft, 1000 ft, 1 mile, and 2 miles along the entire route from PRB to Longview and back to the PRB?
4. How much noise and/or vibration wakes an average person? A light sleeper?
5. How much noise or vibration distracts a working person? A concentrating student?
6. For each train along the entire route, how many crossings are there? How many whistle blasts per crossing? How many whistle blasts in total for a single train traveling from Montana to Longview? How many whistle blasts per day in all (x 16 trains)? How many of these are at night during sleeping hours (8 PM to 8 AM)?
7. For each train, including engine noise, vibration, screeching wheels, and whistle blasts, how many people will be awakened, based on current and projected populations? How many children? How many adults? How many elderly? All calculations must include projected populations as well, since the terminal has an operating span of 50 years.
8. How many times per night will a person be awakened, from noise or vibration, who lives various distances from the tracks (including distances: 50 ft, 100 ft, 250 ft, 500 ft, 1000 ft, 0.5 miles, 1 miles, and 2 miles) in all areas and communities along the route to and from the PRB, including but not limited to Helena, Missoula, Spokane, Vancouver, and Longview?
9. How many awakenings per night, including all people along the entire route up to 2 miles away from tracks, including all trains, based on current and projected populations?
10. Considering the noise and vibration, multiple awakenings and resultant fatigue, how many people may potentially have increased blood pressure, or elevated stress hormones, including current and projected populations?
11. What is the total economic cost of increased blood pressure, elevated stress hormones? Who pays for the economic costs?
12. Considering the noise and vibration, multiple awakenings and resultant fatigue, how many arrhythmias, or heart attacks could potentially result from the increased noise, including current and projected populations? What is the total economic cost of the arrhythmias, or heart attacks? Who pays for the economic costs?
13. Considering the noise and vibration, multiple awakenings and resultant fatigue, how many strokes could potentially result from the increased noise,

including current and projected populations? What is the total economic cost of the strokes? Who pays for the economic costs?

14. Considering the noise and vibration, multiple awakenings and resultant fatigue, how much increased mental disease may result from associated stress, including but not limited to: depression, mental instability, neurosis, hysteria, and psychosis, including current and projected populations? What is the potential economic cost of the increased mental disease? Who pays for the economic costs?
15. What is the potential impact of noise, vibration, multiple awakenings, and fatigue on childhood learning? On childhood test scores? What is the total economic cost of the learning impairment? Who pays for the economic costs?
16. What is the potential impact of noise, vibration, multiple awakenings, and fatigue on workplace performance? What is the total economic cost of the impaired workplace performance? Who pays for the economic costs?
17. How many increased traffic accidents may result from fatigue- associated sleep disturbance, including current and projected populations? What is the total economic cost of the accidents? Cost in terms of human morbidity? Who pays for the costs?

IV. Health Impacts of Delays in Emergency Medical Services

As physicians, we are concerned that increased frequency of very long trains at rail crossings will lead to delayed emergency medical service response times and to increased accidents, traumatic injury and death, and we request a full health impact assessment of this issue along the entire rail corridor across the state as part of the environmental impact statement.

<u>Health Impacts of Rail Crossings: EMS Delays</u>

For many of our most common acute health issues, such as stroke, heart attack, massive hemorrhage, and trauma, every second counts, and a delay of just a few minutes can mean the difference between life and death or permanent impairment and disability. Hospitals routinely measure parameters such as “door to balloon time,” the length of time it takes from the arrival in the Emergency Department until the moment the artery is successfully opened, in the case of a heart attack, to measure the quality of the care delivered and improve outcomes. The same is true for stroke, where thrombolytic medications given to break down clots and to open occluded arteries to the brain can be given only if administered within three hours of the onset of symptoms. Failure to promptly re-establish arterial blood flow to the heart and brain leads to cell death and permanent injury very quickly.

We are aware of a number of locations in Cowlitz County and other counties along the rail corridor where residents may be cut off from emergency medical services by rail lines and access to timely healthcare impaired by increased rail traffic. We are also aware of communities in the state where rail lines separate the major population densities from the hospital or EMS facilities. **It should be considered that an ambulance must cross any tracks twice to bring a patient to a hospital.** Emergent procedures may also be delayed when critical personnel (such as physicians, nurses, anesthesia techs, or people transporting blood for transfusion) are delayed en route to meet a patient at a hospital.

Health Impacts of Rail Crossings: Accidents

Finally, we are concerned that increased rail traffic of the magnitude that is currently proposed has significant potential for increased traumatic injury and death at rail crossings or by derailments. Many crossings on the rail corridor in several states have no barriers or other warning signals, and local city, county, and state governments are struggling financially with limited funds for providing this basic safety service. Data from the Federal Railroad Administration Office of Safety inform us that there were 739 fatalities and 8,167 injuries at railroad crossings nationally in 2010. There were at least 19 coal train derailments in North America in 2012, including fatalities.

Because increased frequency of very long trains at rail crossings will be a direct result of the MBTL, we respectfully request that the EIS include a Health Impact Assessment that addresses the following questions:

1. How many rail crossings are there along potential rail corridors from the Powder River Basin to Longview and back to the Powder River Basin?
2. How many of these rail crossings are unprotected?
3. What are the costs to provide protective barriers at these crossings and who will bear these costs?
4. How often and for how long will these crossings be blocked by the increased rail traffic en route to MBTL? Delay should be calculated for each crossing to account for differences in local circumstances.
5. How many times daily do EMS vehicles, including police, fire and medic units, cross rail lines? Please note that an ambulance needs to cross twice to get a patient to a hospital.
6. What will be the cumulative and per incident delay in access to these services caused by rail traffic en route to MBTL (including actual blockage of the crossing, as well as alleviation of resultant congestion)? Please again note that an ambulance needs to cross twice to get a patient to a hospital.
7. How many people are affected at each crossing, based on current and projected population as shown in relevant planning documents?

8. What crossings and locations are most likely to result in significant delays at crossings?
9. How often are there alternative crossings? How much time is lost to route through alternate crossings, rather than the shortest route?
10. Is there any current established system to alert EMS vehicles of impending crossing closures?
11. How much would such a system cost and who would bear the cost of developing such systems?
12. How does backed up traffic at crossings and the dispersion of that traffic effect EMS response times?
13. How often and to what severity will these delays in EMS response times lead to delays in care and to otherwise avoidable outcomes such as death or permanent disability?
14. What is the amount of healthcare cost attributable to patients receiving delayed EMS services as a result of increased rail traffic?
15. How will the project applicant mitigate these impacts (grade separation at crossings, construction of new hospitals, support for additional paramedics, medivac services, etc.?)
16. How many rail crossing accidents, injuries, and deaths will be attributable to increased rail traffic en route to MBTL?
17. What is the anticipated cost of these accidents, including anticipated litigation and long term care costs?
18. How many coal train derailments would be anticipated to occur across the states of Washington and Oregon over time?
19. Where are the likely sites of these derailments, and are any of these potentially dangerous or inadequately designed rail lines in major population densities?

We thank you for your attention to full disclosure of the potential health impacts of MBTL.

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Additional information listed in "Whatcom Docs Position Statement" and appendices on coaltrainfacts.org.

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