Regarding the Proposed Millennium Bulk Export Terminals (MBT), Longview, WA
Public comment on the 9/30/2016 NEPA Draft EIS, prepared for the Army Corps of Engineers in the Environmental Review Process, Sept 30-Nov 29, 2016.

I am Marjorie Kircher. Thank you for this opportunity to comment on the Corps's recent Draft EIS for the Millennium Bulk terminal proposed for Longview, Washington.

There are many serious health, safety, environmental, and economic concerns around this project, and you are hearing those in detail from many concerned citizens during this comment period. I have a particular health concern, from greatly increasing diesel and coal dust pollution throughout the region.

I've worked as a pediatric occupational therapist in special education in Vancouver, Washington for over 25 years. We in public education have witnessed a profound increase in the number and severity of children (per capita) with neurodevelopmental disorders such as autism, ADHD, and learning impairments. The Centers for Disease Control and Prevention corroborates this increase in their recent counts of pediatric disorders (see references below).

This is likely due in part to increased exposures to neurotoxic chemicals in the environment. Recent studies have correlated prenatal and early life exposure to diesel particulate exhaust with autism, ADHD, lowered IQ and cognitive function, and increased behavioral symptoms of anxiety, depression, and aggressive behavior. Particulate matter and black carbon from diesel exhaust and coal dust, and *heavy metals found in coal dust can cause permanent damage to the developing nervous systems of embryonic and young children, even at low levels. The proposed terminal, which would increase the number of very long trains (8 full and 8 returning mostly empty) passing through the region daily, each carrying 125 uncovered coal hopper cars, pulled by three to four diesel engines, would add cumulative impacts of further diesel emissions and coal dust, to the baseline emissions already occurring. *In addition to particulate matter, coal dust contains neurotoxic heavy metals such as arsenic, cadmium, lead, and mercury, which can be released into air or spilled into waterways near tracks during a derailment, increasing bio-availability.

We know from a recent informative article authored by Daniel Jaffe, et al. from the Univ. of Washington, there are significant air emissions of particulate matter from diesel engines and coal dust released from trains *currently* traveling through the Columbia River Gorge (see link below, also journal is sited in references later):
http://www.atmos.washington.edu/jaffegroup/modules/APOLLO/Jaffe_DPM_coal_dust_trains_ColumbiaRivGorge_2015.pdf
And we know that coal has been found in the Columbia River. (http://columbiariverkeeper.org/top-stories/coal-spills-exposed/)

I find the Corps's NEPA Draft EIS, published 9/30/16, to be inadequate in its assessment of the environmental impact of the MBT. The "study area" it evaluated only includes the project area and rail corridor in the immediate Longview area, without assessing disbursement of diesel particulate matter and coal dust from coal trains traversing the Columbia River Gorge and other states enroute from the Powder River Basin coal mines in Montana/Wyoming, to the proposed facility in Longview. Yet, pollution from these trains will affect the population and environment in a far wider area, which concerns me.

In addition, the NEPA draft EIS assumes that 95% of coal dust is protected from wind erosion through the process of watering/dry fogging, but this doesn't seem adequate in unpredictable stormy weather patterns, as we've seen in recent years.

The other MBT DEIS (from WA Department of Ecology) cites air pollution and diesel particulate matter (DPM) with concern, for Cowlitz County alone:

- Diesel particulate matter was identified as the most likely contributor to cancer risk in Washington State.
- In Longview, all rail traffic in the study area is projected to increase emissions for all air pollutants by about 11%, local but significant.
- Locomotive emissions in Cowlitz County are estimated to increase by about 6% overall with the proposed action. The largest emissions increase for a single pollutant would be for PM10, which would increase by approximately 15%.
- Vessel emissions in Cowlitz County with the proposed action are estimated to increase by about 12%.
- Cumulative vessel traffic in 2038 is projected to increase air emissions by about 24%.
- Table 5.6-10. Estimated Maximum Annual Emissions *in Washington State* for Locomotive and Commercial Marine Vessels for the Proposed Action in Comparison with the 2011 Statewide Emissions Inventory:
  Locomotives will emit 47 tons/year DPM
  (46 tons/year PM2.5 and 47 tons/year 10 DPM)
  Marine vessels will emit 10 tons/year DPM
  (11tons/year PM 2.5 and 13 tons/year of PM 10)

The Ecology MBT DEIS cites coal dust air pollutants with concern:

- Table 6-21 shows violations of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM2.5) from coal dust in Cowlitz County alone.
- "The estimated maximum monthly coal dust deposition along the BNSF main line in Cowlitz County would exceed the trigger level for certain residential receptors (Table 5.7-7)." Chap. 5 at 5.7-21.
- "[R]esidents who live along the main line could experience nuisance levels [of coal dust] which may visible soiling on window sills, outdoor furniture, and other property." Chap. 5 at 5.7-21.

Exposure to toxins in airborne particulate matter from diesel engines and coal dust in the region will predictably increase neurodevelopmental impairments in our children and other adverse health effects in adults and children, such as asthma, cancer, heart attacks and strokes. Over time, this is likely to have a major health impact and cost to our population. Unlike other potential disaster scenarios, additive air toxins from increased trains transporting coal would be a certainty, with well-studied human health effects. I am attaching a reference list of medical journal articles supporting my statements.

This will be at large cost to our society. It creates jobs for special education professionals and ultimately, for long-term care facilities. *Key American medical societies and the world health organization have issued positions on reducing air pollution for the health of the population, noted below.*

Please consider the health and safety of our children who represent the next generations, and *reject* this coal terminal with the "No Action" Alternative.

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SPECIFIC DISEASES ASSOCIATED WITH EXPOSURE TO HIGHER LEVELS OF PARTICULATE MATTER IN AIR POLLUTION

Cancer—Studies relating cancer risk and particulate matter:

- exposure to ozone and PM correlated with development of and mortality from lung cancer (Beeson, Dockery, Pope)
- increased biological markers associated with risk of lung cancer (Demetriou)
- increased oxidative DNA damage predictive of cancer risk (Avogbe)
- increased rates of breast cancer (Crouse, Wei)

Cardiovascular—Studies have linked increased particulate matter with increased cardiac disease:

- increased cardiovascular disease mortality and morbidity in both short term and long term exposures to PM 2.5 (Brook)
- increased hospital admissions for serious cardiac arrhythmias (Peters 2000)
- increased probability of admission for acute myocardial infarction (Mustafic, Peters 2001)
- increased ischemic heart disease, arrhythmias, congestive heart failure (Dominici) and bio markers (HRV) associated with increased cardiac morbidity and mortality (Pieters)
- increased hospital admissions and death from heart failure (Shaw)
- increased risk of congenital cardiac anomalies in children (Vrijheid)

Cerebrovascular – Studies have shown links between particulate matter and adult brain effects:

- increased hospital admissions for strokes(Dominici, Lue, Wellenius 2005)
- significant increase in stroke mortality associated with increase in PM (Chen, Qian)
- increased risk of stroke associated with increased exposure to small PM, black carbon, and nitrous dioxide (Wellenius 2012)
- increased risk of stroke and death from stroke for post menopausal women (Miller)
- structural brain damage and cognitive deficits in middle-aged and older adults (Wilker)

Neurodevelopmental—Studies associating in-utero exposure to particulate matter and:

- increased incidence of autism spectrum disorder (ASD)—(Becerra, Kalkbrenner, Raz, Roberts, Volk 2013, Volk 2011)
- increased incidence of behaviors associated with attention deficit hyperactivity disorder (ADHD) (Chiu, Newman, Perera 2014, Peterson)
  lowered IQ (Calderón-Garcidueñas, Perera 2009, Jedrychowski)
- increased behavioral symptoms of anxiety, depression, social problems, rule breaking, and aggression (Perera 2013)
- neurobehavioral development in children benefited from the shutdown of a coal-burning plant (Perera 2008, Tang)

Pulmonary—Studies have demonstrated the effects of particulate matter on the lungs:

- decreased lung function (WHO 3)
- inhibited lung development in children and adolescents and measurable airway inflammation (Gauderman)
- increased asthma rates and worsening of preexisting asthma and chronic obstructive pulmonary disease (COPD), resulting in increased hospitalization (Carlsten et al., Gowers, Delamater, 2012; HEI Panel, Pandya, Trasande)

General—

- increased mortality from cardiac, respiratory and kidney disease in all members of communities with coal exposure (15,16,17,18 Hendryx 2007, Hendryx 2010, Hendryx 2008, Hendryx 2009)

- long term exposure linked to decreased life expectancy from cardiopulmonary mortality (Krishnan, WHO 4)
- prenatal exposures linked to altered immune system development (Hertz-Picciotto)

KEY AMERICAN MEDICAL SOCIETIES AND THE WORLD HEALTH ORGANIZATION HAVE ISSUED POSITIONS ON REDUCING AIRBORNE PARTICULATE MATTER (LARGELY COMPOSED OF DIESEL EXHAUST):

The *American Heart Association's* 2010 Scientific statement updated and summarized its 2004 position: "It is the opinion of the (AHA) writing group that the overall evidence is consistent with a *causal* relationship between PM2.5 exposure and cardiovascular morbidity and mortality. This body of evidence has grown and has been strengthened substantially since publication of the first AHA scientific statement and, … because the evidence reviewed supports that there is no safe threshold, it appears that public health benefits would accrue from lowering PM2.5 concentrations even below present-day (EPA standards), if feasible, to optimally protect the most susceptible populations." (Brook, see references above)

The American College of Obstetricians and Gynecologists (ACOG) together with the American Society of Reproductive Medicine (ASRM) in October 2013 issued a statement, "The evidence that links exposure to toxic environmental agents and adverse reproductive and developmental health outcomes is sufficiently robust, … individuals alone can do little about exposure to toxic environmental agents, such as from air and water pollution, … calling for timely action to identify and reduce exposure." (ACOG, see references)

The *American Academy of Pediatrics* (AAP) issued a policy statement linking ambient air pollution to adverse health outcomes in children and recommended the National Ambient Air Quality Standards (NAAQS) be promptly reviewed and revised to protect children. (AAP, 2004, reaffirmed 2009, see references)

In October 2013, *WHO's International Agency for Research on Cancer (IARC),* classified both outdoor air pollution, as a whole, and particulate matter, on its own, as carcinogenic. Therefore, it is vital to implement efficient policies to reduce exposure to pollution worldwide. (World Health Organization (WHO 2) and American Cancer Society, see references above).

Relationship to Climate Change:

Transportation of coal not only causes releases of huge amounts of CO2, but also facilitates further emissions from the end-use of the coal, releasing greenhouse gases upon combustion:

The Lancet, a well-respected international medical journal, expressed the need for urgent attention to the health threats of climate change.

The *American Academy of Pediatrics* in Nov. 2015 came out with a strongly worded statement of concern linking global climate change and threats to children's health.

References from the scientific and medical literature

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(Includes neurodevelopmental and all other illnesses in children and adults)

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