David Palazzi

Comment letter attached. thanks. dp

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July 27, 2017

Department of Ecology—SEA Program
Federal Project Coordinator
Post Office Box 47600
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Subject: 401 Water Quality Certification from Millennium Bulk Terminals Longview LLC

Loree
Dear Fe~~deral Project Coord~~inator:

Please accept the following comments from the Washington Department of Natural Resources (DNR) regarding the application for Section 401 Water Quality Certification for the proposed Millennium Bulk Terminal's Coal Export Terminal at Longview, Washington. DNR is the manager of over 3 million acres of state trust lands comprised of forest, range, commercial, and agricultural lands, and 2.6 million acres of state-owned aquatic lands.

DNR is regarded as possessing special expertise under Washington State's Environmental Policy Act Rules, Chapter 197-11-920, Washington Administrative Code (WAC) related to the following areas: water resources and water quality of state-owned aquatic tidelands, shorelands, harbor areas, and beds of navigable waters; natural resources development; energy production, transmission, and consumption (geothermal, coal, and uranium); land use and management of state-owned or managed lands; recreation; and burning in forests. DNR is also an agency with jurisdiction for this project under Chapter 197-11-714(3), WAC.

The proposed project includes two new docks supporting two new ship loaders and an access trestle. Each of these project components would occur on state-owned aquatic lands that are currently leased for an existing dock and related facilities, and would require DNR's approval under the lease. Additional authorization from DNR is also necessary for dredging, ship ingress and egress access outside the lease area, geotechnical studies or other pre-construction activities requiring entry onto state-owned aquatic lands. These authorizations make DNR an agency with jurisdiction under the State Environmental Policy Act, Ch. 43.21C RCW (SEPA) rules. DNR will consider whether to approve the proposed terminal on state-owned aquatic lands after DNR completes a thorough review of the potential project impacts documented through the environmental review, permitting, and public comment processes and any additional information pertinent to its review under the lease.

DNR appreciates the opportunity to submit comments on the 401 Water Quality Certification for this project. The following attachment identifies where DNR has identified probable significant adverse impacts from the proposed transport and handling of coal through the Millennium Bulk Terminal that we suggest be addressed in the Section 401 Certification process.

Should you have any questions regarding this letter, please do not hesitate to contact me at 360-902-1069 or via email at David.Palazzi@dnr.wa.gov.

Sincerely,

David Palazzi, Section Manager
Aquatic Lands Planning and Stewardship

Enclosure

c: file

The Washington State Department of Natural Resources (DNR) have unresolved concerns about environmental impacts from the Millennium Bulk Coal Terminal. These concerns were raised during project scoping phase and during review of the SEPA Draft EIS. The most critical issues fall into five categories:

- Lethal and sub-lethal effects to aquatic organisms and deleterious effects to water quality have been documented from exposure to unburnt coal,
- Contaminants are released into aquatic systems from coal dust deposition and coal spills that have acute and chronic effects on benthic habitat,
- Coal will enter the aquatic environment not only as fugitive dust emissions, but also as sand and gravel-sized pieces that are spilled during transport and handling,
- Estimates of coal dust emissions at the terminal are significantly greater than the FEIS estimates when realistic input data is used in the dust transport model, and
- Surfactants approved for use are only effective for a short time following application. These surfactants contain known chemicals that are deleterious to aquatic organisms and habitats and unidentified compounds with unknown impacts.

1) Lethal and sub-lethal effects to aquatic organisms and deleterious effects to water quality have been documented from exposure to unburnt coal.

Most physical effects to organisms from unburnt, particulate coal in the aquatic environment are similar to that of other suspended sediments (Ahrens and Morrissey 2005). Larger particles cause scouring, and abrasion while smaller particles contribute to turbidity and can smother organisms (Hillaby 1981).

Coal typically has a lower density than Columbia River sediment (1.2-2.4 g cm^{-3} vs 2.65 g cm^{-3} for quartz sediment) so particles of coal will be suspended in the water column for longer periods than the native sediments. Suspended coal particles will directly impact salmonids physically in much the same way as suspended sediments. These impacts include gill trauma, reduction in light or water clarity that can alter predation and prey behavior, changes to osmoregulation, increased stress and stress hormones that reduces immune system function, increased bioenergetics demands as fish travel longer distances to avoid higher suspended sediments concentrations. Indirect impacts include effects on habitat such as reduced light availability for submerged vegetation, and abrasion to plant leaves which reduces cover and habitat connectivity (Bash et al 2001). Factors including time of year, fish life stage, and the characteristics (size, roundedness, rigidity etc.) of the suspended material determine the intensity of effects. The Millennium Terminal is intended to be operating continuously, therefore it is assumed that coal will be deposited into the Columbia River during all salmonid life phases and seasons. No samples of Powder River Basin (PRB) coal as received at terminal were collected for analysis, so the characteristics of the suspended coal is unknown. However, PBR sub-bituminous coal is known to be very friable. By the time it reaches the Port, it will have crumbled into many small particles. Any deposition of coal to the Columbia River during transloading at the Bulk Terminal will result in high suspended solids and turbidity levels. Relatively low concentrations of suspended solids (1.5 -6 mg/L) have been observed to cause physical and behavioral impacts to salmon in Washington rivers (Newcombe and McDonald 1991).

Larger sized coal particles will be transported further than native sediment, and larger coal particles will be deposited in areas of finer sediment silts including on leaves of submerged plants and in pools of slower moving water. A film of fine particles covering submerged vegetation reduces or eliminates light from reaching the plants – interfering with photosynthesis. This will result in reduced or elimination of the submerged aquatic vegetation that is critical salmonid habitat. Sediment deposition into the side pools fills in this essential habitat areas for migrating salmon (Stadler et al 2011)

Juvenile Chinook salmon express "stress proteins" when exposed to coal dust which negatively effects the cellular metabolism of the fish (Campbell and Devlin 1997).

2) Contaminants are released into aquatic systems from coal dust deposition and coal spills that have acute and chronic effects on benthic habitat

Unburnt coal carries native polycyclic aromatic hydrocarbon (PAH) – sometimes in concentrations up to hundreds of mg/kg (Laumann et al 2011). Slow desorption rates from carbon make deposited coal a long-term source of PAHs in the aquatic environment (Achten and Hoffman 2009). PAHs are persistent chemical contaminants. A coal ship that sank in 1891 near Victoria, British Columbia, to this day remains a source of PAHs (Yunker et al 2012). Coal dust and particles deposited into the Columbia River at the terminal, particularly in the area on the shoreward side of the docks where no dredging is planned would make the state owned aquatic lands a reservoir leaching PAHs into the environment.

Aquatic organisms are exposed to PAHS through consumption of contaminated prey, through respiration, dermal contact in water or sediment. A broad array of PAH impacts to aquatic life have been documented ranging from liver function disruption, reduced fecundity of female fish, altered reproductive development in male fish, endocrine disruption, genotoxicity, cardiac toxicity in embryonic and larval development and transgenerational effects (Collier et al 2014). In a reconnaissance contaminant study of 112 analytes in the Columbia River, PAHs were among the top seven found in Pacific lamprey larvae (called ammocoetes) tissue. It is unknown how long ammocoetes stay in a particular stream location, however estimates range from 2-12 years. This protracted, sedentary life in the benthos and their relatively high lipid content predispose them to PAHs (Nilsen et al 2015).

Heavy metals are commonly contaminants of coal. Mercury concentrations in Pacific lamprey ammocoetes from the Columbia River Basin were correlated with concentrations found in river sediments potentially sourced from coal deposition (Linley et al 2016).

Metal and organic contaminants on coal have low water solubility so float on or near the water surface. This aquatic surface microlayer is also where many aquatic organism eggs and larvae tend to float, allowing for extended exposure to occur during the most vulnerable period in an organism's life cycle (Hardy et al. 1990).

Particulate coal deposited to soil near the coal shipping terminal at the Lamberts Point Docks in Norfolk, VA was found to contribute more than half the Arsenic concentrations (up to 17.4 mg/kg) found in the soils. This coal terminal handles 30 % less coal annually than the proposed Millennium Bulk Terminal. While the particulate coal itself may pose only limited health hazards, the transport of Arsenic on the particulate coal provides an exposure route for this toxic contaminant to humans and the environment (Bounds and Johannesson 2007).

In Hapke et al (in prep) PAHs were detected in sediments, invertebrates and fish sampled along gradient of increasing distance from the railway. Highest concentrations were found closer to the railway. The types of PAHs (alkylated) suggests that these are from a petrogenic rather than a pyrogenic source- indicating they were more likely from unburnt coal than from burnt diesel fuel particulates. .

3) Coal will enter the aquatic environment not only as fugitive dust emissions, but also as sand- and gravel-sized pieces that are spilled during transport and handling.

   a. Fugitive coal dust emissions and larger-sized coal particles are deposited to State Owned Aquatic Lands (SOAL) along train route during train transport.

      - Of the entire train route within the border of WA State, nearly 65% of the route is located within 0.1 km of SOAL (Spokane River, Sprague Lake and Columbia River). BNSF estimates 97 lbs of coal dust escape from each train car (12,125 lbs per train) *when surfactants are applied.* Most of this coal is deposited at or within 0.1 to 0.5 km of the railway- directly into waters covering SOAL more than half the time.

      - Coal pieces' spill from around doors of bottom dump cars (some portion Millennium terminal rail cars will be these type- particularly during the first ten years). Dust and larger pieces of dry coal will fall through 'weep' holes this area during rain storms, and coal will be entrained and transported out these holes with rain water. These weep holes are located in each car to allow water to drain out when it rains.

   b. Coal pieces ranging from dust particles to gravel and large rocks will be deposited to SOAL from spills resulting from train derailments, ship/barge accidents, coal fires or explosions.

- From BNSF's own studies, it has been determined that Powder River Basin (PRB) coal, with its high moisture content and begins drying immediately upon exposure to air and falls apart into smaller pieces as it dries out poses a serious threat to the stability of the track structure. PBR sub-bituminous coal tends to cling more to surfaces and is more difficult to remove (its processing tanks require special cleaning equipment). It will coat the tracks and build up a thick film that interferes with functioning train brakes, tends to hold water and warp tracks- leading to accidents and derailments.

- The US Transportation Department reports it assessed more than $15 million in penalties against the US Railroad industry in 2016 for safety violations – this is an increase over 2015. Of the Major railroads, BNSF received the most penalties, with Union Pacific following as a close second – both with over 1,000 violations (NBCrightnow 2016a).

- Examples of coal spill accidents that have occurred within past 5 years
    - In 2012, a train transporting coal derailed and spilled 31 cars of coal in the Eastern Washington town of Mesa, in Franklin County.
    - Westport Terminals, Vancouver Canada Barge hit a coal chute in 2013, spilling coal into Georgia Strait
    - There are an estimated 24 barge accidents per year on Columbia with at least 1/yr carrying coal or fuel.
    - Coal ship grounded 2014 Port Rupert Canada, hole ripped in hull, coal spilled into ocean.

- Spontaneous combustion of PRB coal is a well-known phenomenon. This high-moisture, highly volatile sub-bituminous coal will not only smolder and catch fire as it dries out in storage piles, but has been known to be delivered to terminals by rail car or barge partially on fire. Burning coal emits coal ash particulates that are of even greater toxicity to aquatic life than unburnt coal dust (Pone et al 2007). The highly combustible characteristics of this coal means enclosing conveyors, while reducing dust emissions, increases the explosion hazard.

c. Coal will enter the aquatic environment from continuous dribbling of coal pieces during daily operations transloading from train cars, to conveyors, to storage piles, to pier, and finally to ships.

  - Based on spill rates observed at similar operating bulk handling terminals: Abbot Pt Terminal, Australia and Point of Hay Pt Australia and Westshore Terminal Delta, British Columbia, and Seward Coal Loading Facility, Alaska (Mortimer 2017, Robertson 2017, de Place and Gruen 2016) coal is continually dropped during regular daily handling- at levels below any volume that would trigger clean up action.

- On the aquatic bed, Johnson and Bustin (2005) were able to document a steady accretion of coal dust. They found that coal concentrations in marine sediments effectively doubled in the period covered by their analysis, increasing from a mean concentration of 1.8 percent in 1977 to 3.6 percent in 1999. Concentrations in the immediate area of the coal terminal were as high as 11.9 percent in the later samples, with quantifiable concentrations 1.5 miles away.

4) Coal dust emissions at the terminal will be significantly greater than the FEIS estimates if realistic input data is used in the dust transport model.

Incorrect, unrealistic input values in the Environmental Protection Agency AP-42 Fugitive Dust Model results in an underestimate of the amount of fugitive dust lost in transport to and at the terminal facilities.

Operation	**Annual average Total Suspended Particles (tons/year)**		
	FEIS estimate	Recalculated estimate	variance
Coal pile wind erosion	3.05	3.18	1.27
Coal pile development and removal	2.62	16.38	3.94
Ship transfer and conveyors	5.25	11.40	1.71
From trains during unloading	3.68	4.43	2.22

Total	13.6	35.4

The emission rates we calculated ranged from 1.9 to 6.2 times the values reported in the FEIS.

Critical to modeling the transport and deposition of coal dust accurate coal particle size distribution and density. In comments we provided during the scoping phase, and SEPA

Draft EIS review, characterization of the PRB coal particles as received at the port was requested. In this case characterization meant particle size, density and contaminant concentrations. This information is easily acquired through random grabs sampled from coal cars as they arrive at the terminal (coal is currently transported from PRB to existing bulk handling terminal for Weyerhaeuser). However, no sampling occurred. Instead, coal properties from an Australian site were used as model input.

While specific information on PRB coal characteristics was not available, EPA provides ranges of empirical values for model input. Consultants always selected value that would result in the lower emission calculation- even when these values were indefensible (Riordan 2017) For example, selected input values from ranges of values provided for parameters circled below significantly shifted model output to lowest modeled emission estimates.

Wind erosion from storage piles

$$E= \frac{(k*0.0032)*(U/5)^{1.3}}{(M/2)^{1.4}}$$

Where:

E=estimated uncontrolled emission rate (lbs/ton)

U= local wind speed

M=moisture content

K= aerodynamic multiplier dependent on particle size

Coal piling and moving

E=1.7(s/1.5)*(365)*((365-p)/235)*(f/15)

E=emissions in pounds/acre per day

s= % silt content

f=%time unobstructed wind speed >5.4 m/sec (12mph) @ mean pile height

p=# days with at least .01" precip

Project proponents assumed unrealistically high coal dust suppression rate- (e = 95%). When this value is applied, estimates of fugitive coal dust emitted during transport and transhandling are at the 'below nuisance' levels published in the FEIS.

e= % of suppression

(1-e)*E=volume of coal emitted

Aside from these under estimated emissions, fate of the coal particles once deposited into the water is not evaluated. There is agreement among scientific assessments that highest concentration of coal dust deposition at the terminal is predicted to occur in the nearshore surrounded by coal docks 1-3. The presence of these docks, supporting structures, and berthed ships will change the hydrodynamic flow, likely slowing it and allowing more of the coal dust to remain within tens to hundreds of meters of the site –suspended in the water column just above the bed, or settling out to the bottom surface. Nearly all of the larger sized coal particles deposited during daily operations will accumulate at this site. Bathymetry of this shallow river bank is either unknown or not presented in the FEIS. From coarse resolution mapping of bathymetric data, and assuming a 600 m distance along the riverbank, 150 m waterward and depth sloping from zero at the shore to -5 m depth, the estimated annual maximum deposition of 2 g/ m2 converts to a concentration of 6.06 ug/L. If, conservatively, only 30% of the deposited coal particles remain in this slow-moving water, dust is present in concentrations of 1.89 ug/L. At these suspended sediment concentrations, behavioral changes in salmonids such as avoidance, gill flaring and reduced feeding have been observed (Bash 2001).

5) Surfactants approved for use are only effective for a short time following application. The available information on composition of some of these dust toppers indicates that they contain many of the same chemical contaminants as coal (e.g. chromium, mercury), only in much higher concentrations. Some of the other revealed chemicals are carcinogenic. Material safety sheets for Nalco Dustbind, AKJ CTS 100, and AKJ Dustlock list some components of the products as 'proprietary' or 'trade secret'. Whether these undisclosed constituents are deleterious to aquatic organisms or habitats is unknown and is therefore impossible to assess the environmental impacts.

Surfactant	Surfactant (gal)/water (gal) applied per railcar	Chemicals contained
Nalco Dustbind Plus	2.0/20	Inorganic salt – proprietary Sodium hydroxide
Midwest SoilSement [(4)]	1.25/18.75	Aluminum, Barium, Chromium, Mercury
AKJ CTS-100 [(5)]	1.36 /15	Polyvinyl acetate and proprietary additive
AKJ DustLock [(6)]	1.14 /12.5	Natural vegetable oil base and proprietary blend
Rantech Capture 3000	*2.5 lbs/20	Guar gum
MinTech Min Topper S+0150	1.1/20	Titanium dioxide, hydrated alumina, hydroxyethylcellulose, 2-[(hydroxymethyl)amino]ethanol Potassium tripolyphosphate texanol

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