



January 9th, 2015

André Baugh, Chair
Planning and Sustainability Commission
City of Portland
1900 SW 4th Ave, Suite 7100
Portland, OR 97201

Re: Terminal 6 Environmental Overlay Zone Boundary and Code Amendment

Dear Chairman Baugh and PSC members;

Center for Sustainable Economy (CSE) has the following testimony to offer on the proposed environmental overlay zone boundary and code amendment for Terminal 6 to facilitate Pembina's propane export terminal. CSE and its members have a keen interest in protecting and restoring the Columbia River ecosystem and advancing Portland's vision for sustainable economic development. Approval of this code amendment and subsequent authorization of Pembina's export terminal would be at odds with numerous goals and strategies adopted by the City to advance this vision including those set forth in the Climate Action Plan, the Portland Plan, the Economic Development Plan, the Lower Columbia Estuary Partnership's Restoration Plan and the City's Civil Rights and Environmental Justice Policy.

In particular, approval of the code amendment and subsequent approval of the propane export terminal will sully the City's reputation as a sustainability leader, sacrifice special habitat areas, reduce lands available for export of local products, thwart restoration of Columbia River's riparian zones and fish habitat, further jeopardize threatened and endangered fish, release toxins into air and water, contribute to a significant increase in greenhouse gas emissions, increase public safety risks, exacerbate environmental justice concerns, and pass on significant economic costs to the public, other economic sectors, commuters, and nearby households.

We also believe the Economic, Social, Environmental and Energy effects (ESEE) analysis and Natural Resources Inventory (NRI) conducted for the amendment to be fundamentally deficient at this time and likely to be remanded back the Bureau of Planning and Sustainability (BPS) for further review. The ESEE is arbitrarily limited in scope. The ESEE's treatment of economic, environmental, and social effects is for the most part entirely absent, relying exclusively on an analysis of speculative general effects when actual effects associated with the propane export terminal are reasonably foreseeable. The ESEE improperly assumes implementation of future regulatory requirements to be sufficient for avoiding impacts. In addition, the ESEE fails to reflect collaboration with other state and federal agencies whose regulatory oversight of the

amendment and subsequent development of the terminal would yield invaluable information to inform the ESEE analysis.

Finally, it is clear that BPS failed to provide opportunities for meaningful citizen involvement in either the NRI or ESEE process. For these reasons, we feel that any action by the BPS and the City to adopt the proposed code amendment and permit subsequent development of Pembina's propane export terminal would not only represent a major setback to Portland's vision of sustainable development but also be in conflict with numerous provisions of Oregon's land use law. Our reasons are set forth below:

1. A propane export facility would be at odds with the City's vision of sustainable development.

Over the past decade the City of Portland and its partners have adopted a number of plans, policies, and programs that have helped earn the City a reputation for cutting-edge leadership on sustainable development. Approval of Pembina's propane export terminal will sully that reputation and slow or reverse progress on a number of fronts. In particular:

a. *Climate Action Plan*

In 2009, Portland and Multnomah County adopted an ambitious plan to achieve a 40 percent reduction in greenhouse gas emissions (GHG) by 2030, and an 80 percent reduction by 2050. In December, Portland was recognized as a Climate Action Champion by the White House for its regional climate leadership and for taking decisive action to combat climate change.¹ Approval of Pembina's propane export terminal will put that reputation at risk as well as the many advantages that come with it.

The Climate Action Champion designation is not superfluous. Cities will benefit from facilitated peer-to-peer learning and mentorship and targeted support from a range of Federal programs. Furthermore, "a coordinator will be provided to each Climate Action Champion to foster coordination and communication across the Federal agencies, national organizations, and foundations in support of the Champions. The coordinator will also assist efforts to raise awareness of funding and technical assistance opportunities that are available specifically for Climate Action Champions."²

As a Climate Action Champion, Portland needs to adopt the most innovative and comprehensive carbon accounting framework in support of its GHG reduction goals. This includes accounting for emissions associated with exports of fossil fuels. Accounting for emissions associated with fossil fuel exports is a best practice recommended by some of the world's leading think tanks on climate and energy,³ one recently put in place by Washington State's Department of Ecology,

¹ See White House release at: <http://www.whitehouse.gov/the-press-office/2014/12/03/fact-sheet-16-us-communities-recognized-climate-action-champions-leaders>.

² Id.

³ See, e.g. Dicato, Michael. 2013. "Plugging up the carbon leak: fossil fuel exports and domestic climate policy." Pace Energy and Climate Center, available online at: <http://energy.pace.edu/blog/plugging-carbon-leak-fossil-fuel-exports-and-domestic-climate-policy>. He finds that "Australia's high coal exports

and one now proposed for use in federal decision-making and analyses conducted under the National Environmental Policy Act (NEPA). The proposed NEPA accounting framework would expand NEPA's scope of impacts or effects that must be addressed to include an array of upstream and downstream sources of GHG emissions, cumulative impacts and all other reasonably foreseeable events that are "causally" related to the proposed action.⁴ Portland should provide leadership and adopt this framework now.

It has been suggested that the City should not count the full carbon dioxide emissions of its fossil fuel exports if the end use displaces more carbon intensive fuels such as coal or oil. As one of the potential positive energy effects of Pembina's propane export terminal the ESEE states "[i]f the propane is a substitute for a more carbon intensive fuel such as coal or oil, carbon emissions will be reduced as a result from the use of the propane overseas."⁵ It has also been suggested that to the extent that the propane planned for export was captured rather than flared at the source the City's carbon accounting should also be adjusted downwards.⁶ Neither suggestion makes sense from a mathematical standpoint. A simple example illustrates the point.

Consider two regions, region X and region Y. Assume that region X (i.e. Portland Metro) is currently carbon neutral with zero reportable emissions. Assume that region Y contains major producing oil and gas fields that flare propane by-products. Current annual emissions in region Y are 1,000,000 metric tons CO₂ equivalent, half due to flaring. Now assume that region Y captures flared propane and ships it to region X for export and, eventually, for direct combustion overseas. Reportable emissions in region Y fall to 500,000 metric tons. But to balance the books, they now must rise to 500,000 metric tons in region X since it has pledged to account for emissions associated with fossil fuel exports in line with best practice. If region X also takes credit for reduction in region Y's emissions due to propane capture, it would be double counting and 500,000 metric tons would remain unaccounted for. The bottom line is that credit for any displacement of more carbon intensive end uses downstream or reduced emissions upstream will be taken by those regions and so the issue over displacement at either end is irrelevant to Portland's emissions accounting.

The most likely end use of the propane exported by Pembina from Terminal 6 would be for use in China's burgeoning propylene industry. Propylene is used in a variety of plastics, food additives, and other substances. The process used for propylene production is called propane dehydration (PDH), and is very energy and carbon intensive. Carbon emissions associated with PDH processes include those related to combustion units, process flares, process fugitives, pipeline fugitives, and operation of diesel water pump engines. Greenhouse gases emitted include carbon dioxide, methane, and nitrogen oxide.

make it impossible to develop effective climate policy without accounting for the carbon content of its fossil fuel exports."

⁴ A good summary of the proposed new NEPA guidance is available online at: http://www.sidley.com/2014-12-22-Environmental_Update/.

⁵ Bureau of Planning and Sustainability. 2014. Terminal 6 Environmental Overlay Code Amendment and Environmental Overlay Zone Map Amendment Part 1: Environmental Overlay Code Amendment, page 30.

⁶ Personal communication with Tom Armstrong, PBS, 1/7/15.

The GHG emissions associated with a single PDH plant proposed by Enterprise Products Operating LLC (Enterprise) in Texas were recently inventoried as part of EPA’s New Source Clean Air Act permitting process. Annual GHG emissions from this plant are estimated to be 1,289,149 metric tons per year with a variety of clean air technologies put in place to capture and recycle emissions.⁷ The propane feedstock requirements for this plant are estimated to be 35,000 barrels per day, or 12,775,000 barrels per year.⁸ Direct combustion of this quantity would generate 3,084,189 metric tons of carbon dioxide per year.⁹ This means that for the proposed Enterprise PDH facility, roughly 58% (1-(1,289,149/3,084,189)) of the emissions associated with direct propane combustion would be captured, recycled, changed to another form, or stored in the propylene end products.

However, this does not account for emissions associated with the life-cycle of propane as it is extracted, shipped by rail to the Port, exported by Very Large Gas Tankers and then shipped by rail again to China’s PDH facilities. Nor can it be expected that Chinese PDH facilities use best available technologies (BAT) to capture GHG emissions. So the most prudent way for the City to account for the GHG emissions associated with Pembina’s export terminal is to use the direct propane combustion figure as a proxy.

Pembina’s initial daily throughput of propane begins at 37,000 barrels per day, which translates into 3,259,511 metric tons of CO₂ if the propane is combusted directly. If capacity at the plant expands to its maximum, throughput would rise to 72,000 barrels per day, which translates into 6,342,833 metric tons of CO₂ emissions if the propane is combusted directly. These figures represent 43% to 83% of Portland’s total GHG emissions as reported in the latest inventory. Even if these figures were reduced by 58% to exclude life cycle emissions and assume the best-case scenario of emissions from BAT-compliant PDH facilities in China, this still leaves a GHG emission impact of 1,289,149 metric tons CO₂ at Pembina’s initial capacity rising to 2,508,614 metric tons CO₂ at full capacity. These figures represent 18% to 35% of Portland’s total. Clearly, propane exports mean trouble for attaining Portland’s Climate Action Plan goals and certainly are not in line with White House expectations for Climate Champions.

b. *Economic Development Strategy*

The pillar of Portland’s Economic Development Strategy is to position the City as the “frontrunner to be the capital of the global green economy.”¹⁰ As part of this vision, the City has

⁷ Enterprise Products Operating LLC. 2012. Application for Prevention of Significant Deterioration Air Permit: Greenhouse Gas Emissions. Submitted to the US EPA Region 6, December 18th, 2012. Houston, TX: Enterprise Products Operating LLC.

⁸ As reported by Business Wire:

<http://www.businesswire.com/news/home/20120620006703/en/Enterprise-Build-Propane-Dehydrogenation-Unit#.VK1oySffhzY/>

⁹ Calculations are based on Connecticut Energy Education’s useful energy conversion and emissions data series. The calculations are as follows: 1 barrel of propane is 42 gallons. When combusted, each gallon contains 12.669 pounds of carbon dioxide. There are 2204 pounds in a metric ton. Therefore, 12,775,000 barrels per year is equivalent to 536,550,000 gallons and 6,797,552,000 pounds of CO₂/2204 = 3,084,189 metric tons.

¹⁰ Portland Development Commission. 2009. Economic Development Strategy: A Five-Year Plan for Promoting Job Creation and Economic Growth. Portland, OR: Portland Development Commission.

highlighted the necessity of investments in transit and bicycle infrastructure, tax credits to encourage alternative energy consumption and production and hybrid vehicle usage, and land use and building codes designed to produce dense, green development to serve as a policy framework to guide Portland and the region toward a more sustainable lifestyle. As the strategy notes, “[t]hat policy framework, along with the public ethos behind it, provides certainty for firms seeking to thrive in the sustainable economy.”¹¹

That ethos extends to use of Port infrastructure for exports. A key objective for the Strategy (Objective 1.2) is leveraging the region’s legacy trade assets to expand export and foreign direct investment opportunities for local businesses with expertise in sustainability as well as those seeking opportunities to supply the growing demand for clean technology products, components and services.¹² Using scarce Port lands to facilitate a \$6 billion-a-year foreign company’s exports of a greenhouse gas pollutant to help China be more competitive in production of plastics and unhealthy food additives could not be further from this vision.

c. The Portland Plan

BPS views itself as one of the lead agencies promoting the Portland Plan, a strategic roadmap for the City’s economic prosperity, and one that is based on extensive involvement by community groups, residents, businesses and nonprofits.¹³ One of the key components of that plan is fostering targeted traded sector industries that have competitive advantages locating in Portland relative to other cities. As the Plan acknowledges, “[t]raded sector companies in related industries tend to collect in regions where they have competitive advantages, a phenomenon called industry clusters. This supports greater access to specialized services and suppliers, a strong industry knowledge base, and skilled, experienced workers. Portland has a strategy to support and expand a targeted set of business clusters — advanced manufacturing, athletic and outdoor, clean tech, software, and research and commercialization.”¹⁴ Healthy environments and a policy framework that emphasizes sustainability are key location amenities associated with each of these clusters.

Use of scarce Port of Portland lands for a highly polluting industry that also presents high safety risks to surrounding businesses is in direct conflict with effective promotion of the cleaner, more sustainable enterprises envisioned by the Portland Plan. Importantly, the industry cluster effect also works in the other direction – towards industry flight – if the City does not follow through on its promises and instead degrades the amenities important to the target sector. Pembina’s propane export terminal represents a direct threat to the amenities that foster growth of the Portland Plan’s target industries.

¹¹ Id at 4.

¹² Id at 16.

¹³ Portland City Council. 2012. The Portland Plan: Prosperous. Educated. Healthy. Equitable. Available online at: <http://www.portlandonline.com/portlandplan/index.cfm?c=56527>.

¹⁴ Id at 52.

d. *Lower Columbia Estuary Partnership’s Restoration Plan (LCEP)*

The LCEP includes a large network of public and private partners specializing in habitat restoration, species recovery, planning, ecosystem monitoring, toxics reduction, and education and stormwater management. The LCEP is advancing science, protecting ecosystems, and building connections to sustain the lower Columbia River estuary through its comprehensive restoration plan.¹⁵

As part of that plan, LCEP “strongly believes that for ecosystem restoration and species recovery actions to be successful, it is imperative that the region address toxic contaminants, by knowing and reducing sources of historic, current and emerging chemicals, understanding their pathways and encouraging safer alternatives (i.e., green chemistry) within our restoration, species recovery and RME activities.”¹⁶ As a new source of toxic contaminants such as mercury immediately adjacent to the Columbia’s endangered fish populations, the Pembina propane export terminal represents an impediment to the LCEP Restoration Plan’s progress.

e. *Civil Rights Title VI Plan*

In 2013 the City of Portland adopted its Civil Rights Title VI Plan. Among other objectives, the plan seeks “[t]o avoid, minimize or mitigate disproportionate adverse environmental effects, including social and economic effects, on communities of color and low income populations as a result of City programs, services and activities.” To help achieve this goal, the City has committed to a six-step process for incorporating environmental justice concerns into decision-making. As discussed in Section 2(d) below, the PBS process to date has failed to initiate this process despite the fact that operation of the Pembina export terminal will exacerbate environmental justice issues for communities in Hayden Island, the Oregon Slough, along the propane rail transit route through North Portland, and along the Columbia to Astoria by exposing these communities to an increase in the risk of catastrophic explosions of hazardous substances.

2. The ESEE analysis is seriously deficient and cannot be used as a basis for decision-making.

In support of the proposed code amendment allowing the transportation of propane via pipeline through environmental zones, BPS has prepared an Economic, Social, Environmental and Energy (ESEE) analysis pursuant to OAR 660-023-0250(1).¹⁷ Best practice for conducting legally sufficient and rigorous ESEE analyses appear in Oregon’s administrative rules, guidance manuals published by various state and local agencies, administrative law, and case law. Against this backdrop of best practice, the ESEE prepared in this matter is woefully inadequate.

¹⁵ Lower Columbia Estuary Partnership, 2012. A Guide to the Lower Columbia River Ecosystem Restoration Program, Second Technical Review Draft, Prepared by the Lower Columbia Estuary Partnership, Portland, OR, December 14, 2012.

¹⁶ Id at xii.

¹⁷ The supporting records include: Terminal 6 Environmental Overlay Code Amendment and Environmental Overlay Zone Map Amendment Part 1: Environmental Overlay Code Amendment; (hereafter Terminal 6 Part 1); Part 2: Environmental Overlay Zone Map Amendment (hereafter Terminal 6 Part 2).

In particular:

a. *The ESEE is impermissibly narrow in scope*

The ESEE is impermissibly limited in scope in a number of ways. First, the ESEE “does not consider potential impacts to the riparian corridor.”¹⁸ The reasoning being that (a) the Goal 5¹⁹ rule excludes water-dependent and water-related uses from being considered a conflicting use within riparian corridor resources and that (b) the proposed code amendment requires that the transportation of propane be related to a river-dependent or river-related use.²⁰ This reasoning is flawed.

The actual language of the proposed code amendment permits the transportation of propane through environmental zones on *sites* that have “a *primary* river-dependent industrial use”[emphasis added].²¹ In other words, the code amendment authorizes transportation of propane by pipelines regardless of whether or not the pipeline itself serves water-dependent uses as long as the primary use of the site does. Given that pipeline transportation of propane may be a secondary use of any particular site (used, for example, for local distribution by non-water dependent modes or for transfers between onshore facilities), this renders assertion “b” patently false.

In addition, ESEE procedures do not exempt BPS from analyzing impacts on riparian zones. They merely exempt BPS from complying with certain substantive protections for Goal 5 resources if it is determined that the conflicting use at issue is water dependent or water related. In pertinent part, OAR 660-023-0090 provides: “(7) [w]hen following the standard ESEE process in OAR 660-023-0040 and 660-023-0050, a local government shall comply with Goal 5 if it identifies at least the following activities as conflicting uses in riparian corridors: (a) [t]he permanent alteration of the riparian corridor by placement of structures or impervious surfaces, except for: (A) [w]ater-dependent or water-related uses; ...”. Therefore, exemption from any part of Goal 5 compliance is not synonymous with exempting an impacted riparian zone from consideration in an ESEE. Goal 5, in fact, makes no mention of ESEE analysis at all. For these reasons, the ESEE analysis must be expanded to fully address impacts to the riparian corridor.

Secondly, BPS wrongly and illogically assumes that the proposed code amendment would only affect resources on Terminal 6. The ESEE states “[t]here are approximately 22 lots zoned IH on the Columbia River that could have a river-dependent industrial use. Only the lots owned by the Port of Portland (Terminal 6) have the capability of exporting propane because only the lots on Terminal 6 have access to a navigation channel that is deep enough [43 feet] to accommodate the ships that will be used to export the propane.”²² This assertion is wrong.

¹⁸ Terminal 6 Part 1 at 12.

¹⁹ Goal 5 refers to Oregon’s Statewide Land Use Planning Goals. Goal 5 language is available online at:

²⁰ *Id.*

²¹ *Id.* at 11.

²² Terminal 6 Part 1 at 11.

In 2010 the Port of Portland commenced channel-deepening activities for Terminal 5, which now boasts a depth of 43 feet at Berths 501 and 503.²³ However, it is unclear how existing and future environmental overlays overlap with T-5. A larger issue with this assertion is the unfounded assumption that propane exports by water need ships that draft at 43 feet. In fact, the most common dimensions for LPG carriers are those that draft between 21 and 38 feet.²⁴ Channel depths at this level are far more ubiquitous throughout the Port of Portland and other shorelines along the Columbia and Willamette Rivers. As such, the scope of the ESEE analysis should be extended to all 22 of the lots zoned IH where environmental overlays are present or should be present based on the City's most recent criteria for their application.

Third, the ESEE fails to consider potentially significant impacts associated with disturbance to the shallow water and open water habitats of Terminal 6. According to Port of Portland officials and engineers that have reviewed this proposal, construction of Pembina's export facility will involve significant renovations of the existing floating dock and construction of support structures for the above-water pipelines. This will result in both short-term disturbance to shallow and open waters and the placement of permanent new structures affecting hydrology, fish habitat, and water quality. An increase in vessel traffic and associated air and water pollution will also affect both shallow and open water habitats of Terminal 6.

Lastly, in considering wildlife impacts, BPS failed to discuss impacts to fisheries, including those listed as threatened, endangered, and sensitive. BPS did not exclude fish impacts in accordance with the optional process set forth in Oregon's land use planning regulations, so impacts to fish must be considered.²⁵ According to the NRI information presented in Appendix A, [t]he shallow water habitat of the Lower Columbia River has been designated as critical habitat for federally listed ESA species. Critical habitat is defined as the area between ordinary high water ("OHW") and 34 feet below OHW (NAVD88 vertical datum), and includes riverbanks and floodplains that maintain depths from 0.3 to 6.6 feet during the lower river's tidal cycle. The elevation of OHW around the Terminal 6 site is approximately 20 feet in NAVD88." Listed species in the Columbia that may be affected include 12 species of salmon and steelhead.²⁶

²³ Port of Portland. 2010. "Terminal 5 Berth Deepening Scheduled." *Portside*, page 9. See also: Pacific Northwest Waterways Association. 2014. Columbia River Channel Deepening – Maintenance Needed to Maximize Benefits. Available online at: www.pnwa.net.

²⁴ See, e.g. Gaythwaite, John W. 2004. Design of Marine Facilities for the Berthing, Mooring, and Repair of Vessels. 2nd Edition. Reston, VA: American Society of Civil Engineers.

²⁵ OAR 660-023-0110 provides a "safe harbor" option for local governments to determine that "wildlife" does not include fish, but this process was not used for Terminal 6.

²⁶ According to a recent West Hayden Island biological assessment, these include: Snake River Sockeye Salmon (*Oncorhynchus nerka*) (Endangered), Upper Columbia River Steelhead (*Oncorhynchus mykiss*) (Endangered), Upper Columbia River Spring Chinook Salmon (*Oncorhynchus tshawytscha*) (Endangered), Snake River Spring/Summer Chinook Salmon (*Oncorhynchus tshawytscha*) (Threatened), Snake River Fall Chinook Salmon (*Oncorhynchus tshawytscha*) (Threatened), Snake River Basin Steelhead (*Oncorhynchus mykiss*) (Threatened), Lower Columbia River Steelhead (*Oncorhynchus mykiss*) (Threatened), Lower Columbia River Chinook Salmon (*Oncorhynchus tshawytscha*) (Threatened), Columbia River Chum Salmon (*Oncorhynchus gorboscha*) (Threatened), Middle Columbia River Steelhead Trout (*Oncorhynchus mykiss*) (Threatened), Upper Willamette River Steelhead Trout

b. *Significant environmental effects are omitted or not analyzed in a meaningful fashion.*

The EESE fails to contain even a cursory analysis of environmental effects. As discussed above, BPS limited the scope of the environmental effects it would consider to wildlife habitat, excluding reasonably foreseeable impacts to the riparian corridor, fisheries and both shallow and open water habitats. However, even the discussion of wildlife impacts contains no meaningful information. The only actual adverse impacts discussed in any way are reported in three short bullets that address propane spilled onto the ground, a potential storage tank explosion, and a potential leak into the air.²⁷ Even here, the descriptions do not mention a single affected species. The long term and significant effects associated with construction and operation of a major new industrial facility, loading dock structures and impervious surfaces on what is now natural or semi-natural habitat at T6 are entirely ignored.

c. *Significant economic effects are omitted or not analyzed in a meaningful fashion.*

The proposed code amendment and subsequent development of Pembina's propane export terminal will have a number of reasonably foreseeable economic effects. Economic effects can generally be divided into three major categories: (1) economic impacts on output, value added, employment, income, and tax revenues; (2) net economic benefits, and (3) economic risks. The ESEE is silent on net economic benefits and economic risks, and only discusses economic impacts in terms of positive effects – negative effects are entirely omitted. Despite this, BPS based its final recommendation to move forward with the process to approve the export terminal on the existence of “significant economic benefits in terms of employment, tax revenue, and traded sector facilities” and “positive social impacts related to jobs and personal income.”²⁸ There is no factual basis to support these findings.

i. Economic impacts are not based on an actual analysis

Economic impacts are best understood as a reallocation of economic activity from one sector to another or between regions or nations as investments are made in new productive capacity. Economic impacts are not synonymous with economic benefits – the two terms should not be used interchangeably as is done in the ESEE. The reason is that a positive economic impact here (job gain) usually comes with a corresponding negative impact elsewhere (job loss) and thus represents a transfer of economic activity from one place to another or from one sector (renewable energy) to another (fossil fuels).²⁹ The typical menu of variables used in economic impact analyses include output, value added, jobs, income, and tax revenues.

(*Oncorhynchus mykiss*) (Threatened), Upper Willamette River Chinook Salmon (*Oncorhynchus tshawytscha*) (Threatened).

²⁷ Terminal 6 Part 1 at 28.

²⁸ Terminal 6 Part 1 at 30.

²⁹ For this reason, federal agencies like the Army Corps of Engineers concentrate on National Economic Development benefits that are considered apart from these regional transfers. See: Institute for Water Resources. 2009. National Economic Development Economics Primer. IWR Report 09-R-3. Alexandria, VA: U.S. Army Institute for Water Resources.

With respect to economic impacts, the ESEE provides speculative figures for jobs, personal income, and tax revenues based on two studies that are generalized to Port of Portland operations as a whole.³⁰ However, the applicability of these studies is seriously limited and cannot be used as a substitute for an actual analysis. For example, most direct jobs at the Port are related to movement of cargo over docks.³¹ Different types of cargo have vastly different labor intensities and thus job impacts. For example, in a 2012 study for the Port of Corpus Christi, the number of jobs per 1,000 tons of various commodities was estimated. The biggest job producers were associated with exports of machinery (1.06 jobs per 1,000 tons) chemicals (0.93), and military equipment (0.68). The lowest were associated with bulk grain (0.04) and petroleum products (0.05).³² Thus, the ESEE's application of a generalized "per acre" jobs figure to cargo that has an extremely low labor intensity relative to other types of cargo seriously undermines the projected impacts on employment and income.

With respect to tax revenues, the analysis readily acknowledges that the application of the Port's generalized 2014 analysis may not be appropriate because the actual tax contribution from any new facility would be based on a number of factors including "(1) the assessed value of the buildings and equipment; (2) any property tax abatements offered by local governments (Pembina has not requested any tax abatement); and (3) whether the proponent opts for a different form of property taxation, such as fee in lieu of taxes."³³ Instead of presenting generalized figures on property tax revenues for capital-intensive projects, the ESEE should have attempted to investigate the actual property tax effects with reference to these factors. The assessed value of buildings and equipment associated with typical propane export terminals, for example, is data that is relatively easy to obtain.

A more fundamental issue with the economic impact figures is the lack of any negative consequences on jobs and public finance. These may be considerable. The export of propane to support China's burgeoning PDH industry may ultimately displace jobs associated with propylene manufacturing and distribution in the US – a well-established effect associated with trade agreements implemented over the past 30 years that help make Chinese manufacturing more competitive. With respect to tax revenues, it is important to consider net impacts and not simply report new tax collections. Negative fiscal impacts also need to be disclosed. Pembina's export terminal may involve several categories of negative fiscal consequences including (1) increased costs of servicing new infrastructure; (2) increased public costs associated with

³⁰ These include: Martin and Associates. 2012. The Local and Regional Economic Impacts of the Port of Portland, and the Port of Portland's 2014 property tax impact analysis of capital-intensive terminal developments. No reference information was provided for the latter study. In addition, the ESEE makes reference to some additional work by Martin and Associates in 2014 but did not append this to the ESEE or formally incorporate it in any way. However, in reviewing the methods memo it is clear that Martin and Associates simply applied 2012 per-acre figures to the acres affected by Pembina's proposal to get its direct, indirect, and induced jobs figures.

³¹ Terminal 6 Part 1 at 19.

³² Martin Associates. 2012. The Local and Regional Economic Impacts of The Port of Corpus Christi. Prepared for the Port of Corpus Christi. Lancaster, PA: Martin Associates. Corresponding figures for the Port of Portland were not calculated, and so we reference this study for illustrative purposes.

³³ Terminal 6 Part 1 at 21.

emergency response, policing, Coast Guard protection of Very Large Gas Containers and safety; (3) increased regulatory oversight costs; (4) decreased residential property values and associated tax collections. These negative fiscal consequences cannot simply be ignored.³⁴ Planning and land use regulations define ESEE consequences quite clearly: ESEE consequences “are the positive *and negative* economic, social, environmental, and energy (ESEE) consequences that could result from a decision to allow, limit, or prohibit a conflicting use” [emphasis added]. OAR 660-023-0010(2).

ii. Net economic benefits

Net economic benefits are distinct from economic impacts. The concept of net economic benefits is used to measure the ultimate effect of a project, program, or policy on economic wellbeing of a region’s population taking both positive effects (benefits) and negative effects (costs) into consideration. Net economic benefits can thus be negative (costs exceed benefits), neutral (costs equal benefits) or positive (benefits exceed costs). Three core determinants of economic wellbeing factor into an analysis of net economic benefits: (1) benefits associated with the consumption of goods and service bought and sold in the market; (2) benefits associated with non-marketed goods and services provided by human, social, built, and natural capital, and (3) the externalized costs economic activity passes on to society as a whole. Circular A-94 is a well-established methodology mandated by federal law that utilizes this general framework.³⁵ Sustainability metrics like the Genuine Progress Indicator (GPI) also capture economic wellbeing in these three dimensions and are available for use in policy analysis at the City level.³⁶

From the standpoint of economic wellbeing, Pembina’s export terminal will not produce any goods or services used by consumers in the local economy. However, it may result in a net increase in personal income (as long as job creation exceeds job loss) and to the extent that this income is spent in the local economy, it will contribute to the first class of economic benefits in Portland. Nor will Pembina’s export terminal involve any direct investments in human, social, built, or natural capital that benefit area residents. However, should public tax revenues rise and be used for beneficial investments in schools, river restoration, water infrastructure and the like, consumption of non-market goods and services may increase.

With respect to externalized economic costs, there are many to consider. Permanent loss of special habitats in Terminal 6 as well as the functionality of shallow and open water habitats will reduce the annual value of ecosystem services they provide. Ecosystem service values for Terminal 6 have been estimated, so the loss of these values as the site is developed should be

³⁴ Also see: Oregon Statewide Planning Goal 5, Economic, Social, Environmental and Energy (ESEE) Analysis Template. The template provides examples of fiscal variables to consider, including “cost of installation/maintenance of public infrastructure (roads, stormwater, utilities).”

³⁵ White House, Circular A-94, revised, available online at:

http://www.whitehouse.gov/omb/circulars_a094/.

³⁶ See, e.g. Talberth, John and Michael Weisdorf. 2013. Economic Wellbeing in Baltimore: Results from the Genuine Progress Indicator. Washington, DC: Center for Sustainable Economy. Available online at: <http://sustainable-economy.org/solutions/baltimore-genuine-progress-indicator/>.

incorporated into the ESEE.³⁷ The second is the costs associated with increased air and water pollution. The third includes the increase in carbon emissions damage associated with the ultimate combustion of Pembina's propane. As previously noted, Pembina's export terminal will contribute to a 3.3 to 6.3 million metric ton increase in carbon dioxide emissions. This translates into a social cost of between \$134 and \$260 million per year using EPA's most recent figure for the social costs of carbon dioxide emissions (\$40.96 per ton in 2014 dollars).

Another reasonably foreseeable externalized cost category is the increase in rail congestion and the associated economic costs to commuters and commercial transport of goods. According to the ESEE, "[p]ropane will be unloaded from rail cars arriving approximately one unit train every two days (a unit train carries a single commodity, in this case propane, and is approximately 100 cars in length)." Additional train traffic in an already highly congested industrial corridor will further exacerbate delays and associated costs of transport and commuting. According to interviews of Port users published by the City in connection with its Working Harbor Reinvestment Strategy, "[o]vercommitted rail appears to be the area's most pressing competitive need."³⁸

An adequate ESEE analysis should quantify any of these effects it can to the extent practicable, and, at the very least, discuss in qualitative terms the remainder. As now written, the ESEE is silent on all of these benefit and cost categories.

iii. Economic risks

The third category of economic effects that should be addressed by the ESEE is economic risk. There are several types of economic risk associated with the Pembina export terminal. The potential public and private costs associated with a catastrophic explosion are well understood, and of most concern. The Toronto propane explosion in 2008 caused thousands of people to be evacuated from their homes and cost C\$1.8 million to clean up, half of which was paid by the province of Ontario. The Falk Corporation explosion in Milwaukee in 2006 killed three, injured 46, and caused \$75 million in damages to the facility alone.³⁹ The standard framework for addressing catastrophic risk is to develop scenarios for certain risk events, assign probabilities to those events, calculate the direct and indirect economic damages that would occur if the event occurred, and then incorporate the resulting expected values of these costs into benefit-cost analysis or other analyses of economic effects. There are well-established methods and sources of information BPS can rely upon to do so.⁴⁰

³⁷ Terminal 6 Part 2, Appendix B.

³⁸ Port of Portland. 2006. Working Harbor Reinvestment Strategy: Business Interview Results. Portland, OR: Port of Portland, Portland Development Commission and the Bureau of Planning and Sustainability.

³⁹ Reported in the Milwaukee Business Journal, available online at:

<http://www.bizjournals.com/milwaukee/stories/2008/09/08/story2.html?page=all>.

⁴⁰ See, e.g. Public Safety Canada's comprehensive "All Hazards Risk Assessment Methodology Guidelines 2012-2013." Available online at: <http://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/ll-hzrds-sssmnt/index-eng.aspx#iap>.

Other types of economic risk are associated with market volatility⁴¹, abandonment of industrial infrastructure⁴², and unforeseen factors affecting public finance⁴³. Market volatility is especially relevant to the propylene industry and thus may lead to dramatic swings in employment and unemployment associated with the Pembina export terminal. According to ICIS, the world's largest petrochemical market information provider: “[i]n these times of wild propylene volatility, when prices are just as apt to swing up by 15 cents/lb (\$331/tonne, €255/tonne) one month as they are to swing back down by 20 cents/lb the next, it is hard to imagine a future golden age for any of its derivatives - especially polypropylene (PP).”⁴⁴ All of these sources of economic risk may burden the City of Portland with additional costs, and thus, at very least, should be noted in the ESEE. As currently written, the ESEE is silent on all aspects of economic risk.

Because BPS's determination of positive economic consequences is not based on findings of fact, the ESEE supporting this determination must be reconsidered in a rigorous fashion by addressing all types of economic impacts, net benefits, and risks that may arise in conjunction with approval of the code amendment and subsequent approval of Pembina's propane export terminal. In 1987, the Oregon Court of Appeals addressed the issue of faulty and incomplete ESEE analysis and its use as a basis for decision-making. The ruling still controls today. In *Friends of the Columbia Gorge et al. vs. LCDC*, the Court found that the ESEE did “not provide a basis for suggesting what the economic consequences would be” and because of this, found that “the analysis is inadequate to serve as a planning tool or to provide reasons to explain the city's decision.”⁴⁵ The identical facts are present in this matter.

d. Significant social effects are omitted or not analyzed in a meaningful fashion.

According to ESEE guidance, important social effects may include aesthetic value, recreational value, local quality of life, housing costs, and social equality.⁴⁶ The ESEE in this matter purports to analyze four social effects: employment, access to recreation, screening and buffering, and historic and cultural values. As discussed in the previous section, employment projections are highly suspect and should not be used because they were based on figures that did not account for the very low labor intensity associated with petroleum product exports. However, the biggest issue with the social effects analysis is its failure to discuss environmental justice concerns and social impacts associated with rail-induced traffic congestion. Both of these effects are related to social equality and thus ought to be addressed.

⁴¹ See, e.g. Bolado, Ricardo, Francesco Grceva, Peter Zeniewski, Pavel Zastera, Lenhard Vanhoorn and Anna Mengolini. 2012. Best Practices and Methodological Guidelines for Conducting Gas Risk Assessments. EUR 25227 EN. Brussels: European Commission.

⁴² See, e.g. Talberth, John and Evan Branosky. 2013. Oil and Gas Infrastructure in Cook Inlet, Alaska. A Potential Public Liability? Portland, OR: Center for Sustainable Economy.

⁴³ See, e.g. Government Finance Officers Association. 2011. Assessing Risk and Uncertainty in Economic Development Projects. Chicago, IL: GFOA. Available online at: <http://www.gfoa.org/assessing-risk-and-uncertainty-economic-development-projects>.

⁴⁴ ICIS: Market outlook: New PDH units may lead to US polypropylene resurgence: <http://www.icis.com/resources/news/2013/04/05/9656095/market-outlook-new-pdh-units-may-lead-to-us-polypropylene-resurgence/>.

⁴⁵ 85 Or App 249, 736 P2d 575. Available online at: <http://www.gorgefriends.org/downloads/Friends.v.LCDC.html>.

⁴⁶ ESEE Template, Note 17.

Operation of the Pembina export terminal will exacerbate environmental justice issues already noted for communities on Hayden Island, the Oregon Slough, along the propane rail transit route through North Portland, and along the Columbia to Astoria by exposing these communities to an increase in the risk of catastrophic explosions of hazardous substances. There are three potential blast scenarios to consider: (a) pool fires that could ignite from damage or leaks in Very Large Gas Carriers (VLGCs); (b) explosions at the propane facility, and (c) explosions of propane filled rail cars. The impact zone associated with each type of incident extends well into communities with known environmental justice issues. For example, according to Martin and Associates' informal jobs analysis of the Pembina export terminal, "liquid propane gas will be loaded into 44,000 Deadweight Tonnage Very Large Gas Carrier (VLGC) vessels approximately 2 times per month." Communities all along the route of these VLGCs will be exposed to increased catastrophic explosion risks. The consequences would be severe. Describing one scenario, James Fay, an MIT professor says that a hole in a gas tanker "could result in liquid leaking out of the storage vessel faster than it would burn off, resulting in an expanding pool of fire."⁴⁷ A 2004 study by the Sandia National Laboratory suggests that such a fire would be hot enough to melt steel at distances of 1,200 feet, and could result in second-degree burns on exposed skin a mile away.⁴⁸

Given the serious nature of environmental justice concerns with the Pembina propane export facility, the City should follow its Civil Rights Title VI Plan and adhere to the principles of environmental justice analysis and decision making, which include: (1) early identification and engagement of affected communities; (2) clear articulation of the problem, and solutions that fit both the problem and the needs of the community affected by the project; (3) consideration of the accumulation of the environmental hazards in the impact areas; (4) documentation of why decisions were made and analysis of the impact on the community of that decision; (5) determination if the impacts disproportionately burden or benefit a community, and (6) any additional considerations such as mitigation, environmental assessment, and supplemental benefits that support the decision.⁴⁹

Another reasonably foreseeable social impact would be associated with commuter delays caused by adding additional rail traffic to areas that are already experiencing long waits at rail crossings. North Portland is of particular concern.⁵⁰ The ESEE should be reconsidered to address this issue as well.

⁴⁷ See Council on Foreign Relations, "Liquefied Natural Gas: A Potential Terrorist Target," available online at: <http://www.cfr.org/natural-gas/liquefied-natural-gas-potential-terrorist-target/p9810>. LPG is considered more dangerous than LNG.

⁴⁸ Id.

⁴⁹ Civil Rights Plan, Note 3 at 6.

⁵⁰ See, e.g. Northwest Public Radio, "Dozens of Coal Trains Could Mean More Delays on Congested Northwest Rails and Roads," available online at: <http://nwpr.org/post/dozens-coal-trains-could-mean-more-delays-congested-northwest-rails-and-roads>.

e. *Significant energy effects are omitted.*

The ESEE addresses the increased electricity use needed for refrigeration and compression at the proposed propane export facility. This was estimated to be 8,000 MWh per month, and will contribute to a 0.7% increase in Portland's annual carbon emissions. The analysis also discusses the carbon footprint associated with end uses of the propane assuming it will be directly combusted. The figures are roughly in line with the carbon footprint analysis contained in Section 1(a), above. However, they appear to be too low (i.e. the top end of the range is 6.3 million metric tons per year not 5).

What is missing from the energy consequence section is the increase in energy consumed by rail and by ships as the propane enters and exits the Port. The facility will also require energy for operations beyond just refrigeration and compression. All these significant sources of energy consumption should be identified and discussed.

3. The code amendment and ESEE were not informed by consultations with other agencies.

The eventual construction of a major energy export facility at Terminal 6 will require consultations and cooperation with a number of state and federal agencies that have regulatory authority over environmental analysis, hazardous substances, air pollution, water pollution, construction activities in waters of the State, fish, and wildlife. Land use and planning regulations require this coordination. With respect to actions that affect wildlife, regulations require that local governments "coordinate with appropriate state and federal agencies when adopting programs intended to protect threatened, endangered, or sensitive species habitat areas." OAR 660-023-0110 (6). Despite this, the ESEE is silent on both the required consultations and regulatory processes or, more importantly, the expert input from these agencies. These include⁵¹:

a. *Energy Siting Council*

Under Oregon statute, large energy facilities in Oregon must have a Site Certificate from the Energy Facility Siting Council (EFSC), a board of appointed citizens staffed by the Oregon Office of Energy (OOE).⁵² The EFSC performs a review for the siting of large energy facilities, including types of electric power plants, transmission lines, surface facilities associated with underground natural gas storage, liquid fuel pipelines, liquefied natural gas storage facilities, natural gas pipelines, synthetic fuel plants, small generating plants within "energy generation areas," radioactive waste disposal, and plants that convert biomass to gas, liquid or solid fuel product.⁵³

⁵¹ Unless otherwise noted, the regulatory processes described in this section are paraphrased from the Oregon Plan for Salmon and Watershed's "A guide to Oregon Permits issued by State & Federal Agencies with a focus on permits for Watershed Restoration Activities."

⁵² ORS 469 *et seq.*

⁵³ An overview of the siting process is available online at: <http://www.oregon.gov/energy/Siting/Pages/process.aspx>.

b. *Army Corps of Engineers (ACOE)*

The ACOE issues federal permits for dredge and fill activities in U.S. waters, regardless of the amount of area affected by the activity and the amount of fill used. Permits are required by Section 10 of the federal Rivers and Harbors Act and Section 404 of the Clean Water Act. The ACOE's jurisdiction extends to the ordinary high water or high tide line, and thus applies to all work associated with the Pembina export terminal on the immediate shoreline, on the loading dock, between these areas, and beneath the surface in association with any support structures that need to be put in place.

c. *U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS)*

Before issuing a Section 404 permit, the ACOE will have to consult with the USFWS and NMFS over the potential impacts of Pembina's propane export terminal on all species listed as threatened or endangered under the Endangered Species Act. The consultation process is outlined in Section 7 of the Act and its implementing regulations at 50 CFR § 402.10 to § 402.16. Reasonable and prudent measures to avoid taking of listed species will be identified and will have to be incorporated into the design of the dock and support structures. Species for which formal consultation is required may include all of the salmon and steelhead species noted previously (see footnote 17) and the Aleutian Canada goose (*Branta canadensis leucopareia*), which was included in a biological assessment for projects on Hayden Island.

d. *Oregon Department of Environmental Quality (DEQ)*

The Oregon Department of Environmental Quality (DEQ) issues permits in accordance with state and federal laws that regulate the discharge of pollutants into the environment. Permits that may apply in this case include wastewater, stormwater, and air quality. All sewage treatment plants and industrial facilities that discharge wastewater to surface waters in Oregon must obtain a National Pollution Discharge Elimination System (NPDES) Permit from DEQ. Facilities that do not directly discharge to surface waters require a Water Pollution Control Facilities (WPCF) Permit. Certain storm water discharges associated with industrial activity must obtain an NPDES storm water discharge general permit. In general, this permit is needed if storm water from rain or snow melt leaves the site through a "point source" and reaches surface waters either directly or through storm drainage, and if the activity or industry is listed by EPA.

e. *Division of State Lands (DSL)*

Oregon's Removal-Fill Law requires DSL to issue removal-fill permits to conserve, restore and maintain the health of Oregon's waters. DSL's jurisdiction extends to the ordinary high water or high tide line, or to the line of non-aquatic vegetation - whichever is higher. Currently, DSL and ACOE use a joint permit application form, so that in many cases applicants only need to fill out one application to obtain both permits. However, projects do require separate authorizations (or permits) from DSL and ACOE.

4. BPS failed to provide for citizen involvement in preparing the ESEE and NRI

The ESEE and NRI were prepared without citizen involvement. Instead, the public are being invited to a *post hoc* hearing on January 13th, 2015 to provide testimony on the completed ESEE analysis, the final NRI,⁵⁴ the proposed code amendment, the proposed environmental overlay adjustments and BPS's final recommendations. These were first made available to the public on December 12th, 2014 and did not include nor make any reference to the citizen involvement process required by Oregon's land use regulations.

Those regulations are explicit and unambiguous in their requirements for early involvement: “[l]ocal governments shall provide timely notice to landowners and opportunities for citizen involvement during the inventory and ESEE process. Notification and involvement of landowners, citizens, and public agencies should occur at the earliest possible opportunity whenever a Goal 5 task is undertaken in the periodic review or plan amendment process” (OAR 660-023-0060). As such, should BPS continue to consider a code amendment to facilitate Pembina's propane export terminal, it is clear that the ESEE and NRI process must be started anew with ample opportunities for early involvement by all stakeholders.

For the reasons set forth above, CSE requests that BPS recommend no change in current zoning and prohibit the proposed conflicting use associated with Pembina's propane export terminal. If you wish to discuss any portion of these comments in more detail, please don't hesitate to call me at (503) 657-7336. We look forward to discussing these points with you during the January 13th hearing.

Yours truly,



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⁵⁴ BPS maintains that the Terminal 6 NRI is based on a citywide inventory completed in 2012, which automatically replaces previous inventories related to Terminal 6. Yet that inventory quite clearly states “[t]he new inventory information can be put to a number of uses, but will *not* automatically replace Portland's adopted inventories. Inventories used to inform land use decisions will be updated through area-specific or citywide legislative projects, such as the River Plan [emphasis added]”. See: BPS. 2010. Natural Resource Inventory. Portland Plan Background Report. As such, an area-specific NRI must be initiated for Terminal 6 with opportunities for citizen involvement early on.