Organizations

Table B-6. Organizations

Submission Number	Commenter Name
TRANS-LV-M2-00009	Association of Northwest Steelheaders & Northwest Guides and Anglers Association
2939	Association of Washington Business
TRANS-LV-M1-00040	Association of Washington Business
TRANS-PASCO-M1-00061	Association of Washington Business
TRANS-LV-M2-00080	At Home Ministries of Oregon
2558	Black Hills Audubon Society
TRANS-SPOKANE-M2-00007	Brotherhood of Local Engineers and Trainmen
TRANS-PASCO-M1-00059	Brotherhood of Locomotive Engineers and Trainmen in Washington State
3317	Campbell County Chamber of Commerce
TRANS-PASCO-M2-00008	Central Washington Building Construction Trade Council
TRANS-SPOKANE-M2-00005	Chamber of Commerce & Economic Development Organization, Greater Spokane Incorporated
TRANS-SPOKANE-M2-00014	Citizens Alliance for Property Rights
0478	Citizens for Sensible Transportation Planning
2529	Climate 911
TRANS-SPOKANE-M2-00062	Climate Solutions
2342	Columbia River Bar Pilots
2265	Columbia River Steamship Operators' Association, Inc.
TRANS-SPOKANE-M2-00068	Community Building Foundation
TRANS-LV-M2-00033	Council Longview Chamber
TRANS-PASCO-M1-00069	Earth Ministry
TRANS-SPOKANE-M2-00066	Earth Ministry
3277	Earthjustice
3462	Environmental Priorities Coalition
2712	Friends of Alaska National Wildlife Refuges
0687	Friends of Grays Harbor
2589	Friends of Grays Harbor
2508	Friends of the Columbia Gorge
2233	Friends of Two Rivers
TRANS-LV-M2-00016	Greenpeace
TRANS-LV-M1-00023	Houck Neighborhood Association
3492	Idaho Conservation League
TRANS-LV-M2-00026	ILWL21
2443	Industrial Energy Consumers of America
TRANS-SPOKANE-M1-00066	International Association of Machinists and Aerospace Workers
TRANS-SPOKANE-Q1-00006	Lake Pend Oreille Waterkeeper
TRANS-LV-Q3-00028	Landowners and Citizens for a Safe Community
TRANS-PASCO-M1-00040	Landowners and Citizens For a Safe Community
1743	League of Women Voters of Bellingham/Whatcom
2535	League of Women Voters of Washington
TRANS-LV-M1-00006	League of Women's Voters of Washington State
2658	Maritime Fire & Safety Association

Submission Number	Commenter Name
2987	National Association of Manufacturers
3329	National Wildlife Federation
TRANS-SPOKANE-M2-00009	National Wildlife Federation
1910	New Progressive Alliance
2504	Northern Plains Resource Council
3327	Oregon and Washington Physicians for Social Responsibility
3617	Oregon Interfaith Power & Light
TRANS-LV-M1-00039	Oregon Nurses Association
TRANS-LV-M1-00001	Oregon Physicians for Social Responsibility
TRANS-LV-M1-00027	Oregon Physicians for Social Responsibility
2325	Oregon Wild
3387	Our Children's Trust
3126	Pacific Northwest Waterways Association
TRANS-SPOKANE-M2-00055	Pasco Chamber of Commerce
1477	Pennsylvania Manufacturers' Association
TRANS-LV-Q1-00059	Portland Raging Grannies
2449	Safe Energy Leadership Alliance
TRANS-PASCO-M1-00080	Sierra Club
3411	Sightline Institute
2445	SMART-Transportation Division
3406	SMART-Transportation Division
TRANS-LV-M2-00038	SMART-Transportation Division
TRANS-PASCO-M2-00047	SMART-Transportation Division
TRANS-SPOKANE-M2-00042	SMART-Transportation Division
1183	Southern Oregon Climate Action Now
2352	Southwest County Coalition
0375	Spokane Canoe & Kayak Club
TRANS-SPOKANE-M2-00010	Spokane Community Kayak Club
3280	Spokane Riverkeeper
3464	Sravasti Abbey Corp
1764	Stewards of the Greys
2515	The Lands Council
2536	The Lands Council
TRANS-PASCO-M1-00060	Tri-City Development Council
1753	Tri-City Regional Chamber of Commerce
3110	U.S. Chamber of Commerce Institute for 21st Century Energy
TRANS-LV-M2-00083	United Association Local 26, Plumbers and Pipefitters
TRANS-SPOKANE-M1-00008	United Transportation Division, Local 426
TRANS-PASCO-M2-00005	Washington and Northern Idaho District Council of Laborers
TRANS-SPOKANE-M1-00005	Washington Farm Bureau
3658	Washington Physicians for Social Responsibility
3659	Washington Physicians for Social Responsibility

Submission Number	Commenter Name
TRANS-LV-M1-00041	Washington Physicians for Social Responsibility
TRANS-LV-M2-00059	Washington Physicians for Social Responsibility
TRANS-PASCO-M1-00029	Washington Physicians for Social Responsibility
3168	Washington Public Ports Association
TRANS-SPOKANE-M1-00006	Washington State Building and Construction Trade Council
TRANS-LV-M2-00032	Washington State Building and Construction Trades Council
TRANS-LV-M2-00012	Washington State Building Trades
TRANS-SPOKANE-M1-00007	Washington State Legislative Board, Brother of the Local of Engineers and Trainmen
TRANS-LV-M2-00039	Washington State Legislative Board, Brothers of the Locomotive and Engineers and Trainmen
2268	Western Organization of Resource Councils
3352	Western Research Institute
3465	Willapa Hills Audubon Society
TRANS-LV-M2-00109	Willapa Hills Audubon Society
TRANS-LV-Q3-00031	Willapa Hills Audubon Society
1759	Wyoming Business Alliance
2969	Wyoming County Commissioners Association
2586	Wyoming Infrastructure Authority
3466	Wyoming Mining Assocation

Submission Number: ***TRANS-LV-M2-00009***

Received: 5/24/2016 12:00:00 AM
Commenter: Bob Reece
Organization: Association of Northwest Steelheaders & Northwest Guides and Anglers Association
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Bob Reece (phonetic), representing two different organizations today: The Association of Northwest Steelheaders, a 56-year-old organization representing 1600 members in Oregon and Southwest Washington that collectively contribute 30,000 volunteer hours to the recovery of salmon and steelhead in the Pacific Northwest. I also represent the Northwest Guides and Anglers Association, about 35 members strong, that take over ten thousand sport angler trips on the Columbia River in northwest Oregon and southwest Washington.

We're obviously deeply invested in our region's unique and iconic species, the fish and wildlife, that the northwest sportsman has been pursuing for decades. We want to hand this heritage down to our children. So, when developing the EIS and the coal program, we ask you to take into account the true cost of coal including emerging science that shows the effects of ocean acidification on a multimillion dollar crab fishery, a multimillion dollar oyster industry, Pacific shrimp and the deterioration of tetrapods and copepods that feed our juvenile salmonids and our forage fish in the Pacific Ocean.

Coal dust I had heard has no effective impact on our environment. I cannot believe that when you lose one pound of coal dust per car per mile on a 150 mile trek down the Columbia River that we don't have some sort of chemical reaction going on that would affect our aquatic ecosystems.

Climate change is real, it is here, and we are seeing it intensify. We are coming off of an intensive El Niño event. We encourage no action.

Thank you.

June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Millennium Bulk Terminals draft Environmental Impact Statement

Dear Co-Lead Reviewers:

On behalf of the Association of Washington Business (AWB), and the under signed companies and organizations, we are writing to express our support of the proposed Millennium Bulk Terminals (MBT-Longview) project.

AWB is the state's oldest and largest statewide business association, which includes nearly 8,000 employers representing 700,000 employees, including those that have signed this letter with us. AWB serves as both the state's chamber of commerce and the manufacturing and technology association.

We are pleased to see the release of the draft Environmental Impact Statement (DEIS) for the MBT-Longview proposal, and are appreciative of the work put forward by the co-lead agencies, Ecology and Cowlitz County.

As you are aware, Washington is one of the most trade-dependent states in the nation. The MBT-Longview project, as with other projects of statewide significance, represents growth opportunities that will boost and enhance the state's trade capacity. In order for our state to remain competitive in a global economy, we need a fair and timely review of all projects to ensure and protect our competitive opportunities.

The MBT-Longview project will provide family-wage jobs in a part of the state that needs them– more than 2,600 direct and indirect jobs during construction, and 300 permanent direct and indirect jobs – delivering economic stimulus for the region and state. Many of these jobs are blue collar positions, which are unfortunately becoming rarer. The project will also generate additional tax revenue – more than $37 million to the state and $5 million to the county during construction, and ongoing operations that generate nearly $6 million in tax collections for the state, local governments and special purpose districts annually.

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Local communities are already reaping the benefit of the partnership developed by MBT-Longview and former property owners, who are providing oversight on the ongoing clean-up of the former Reynolds Longview site. While the clean-up of the site is a separate project than that considered under the DEIS, it shows the commitment and environmental stewardship one can expect from MBT-Longview.

While we appreciate the rigorous review conducted by the co-lead agencies, and the release of the DEIS, we are concerned with the length of time and costs associated with such a review thus far. At more than four years in length, and nearly double the time of other significant project reviews, it is time to finish this review. The employer community needs the assurance of regulatory certainty. We strongly support a rigorous and thorough review of all projects, as well as compliance with environmental laws. When the review becomes a significant delay, however, the project proponent and beneficiaries of the project are unnecessarily harmed.

Several of the DEIS' major findings show there will be no significant environmental impacts to the proposed site, or state, as a result of this project. In fact, the DIES debunks many of the serious claims of environmental impact, showing the proposal will have no adverse impacts to the natural environment. These include issues related to coal dust, rail and vehicle traffic, among others.

Despite the lack of environmental impact to the site of the project, a key provision in the DEIS will require MBT-Longview to contemplate and mitigate for greenhouse gas (GHG) emissions that are not only beyond the boundaries of this project and state, but also beyond the scope of your granted legislative authority. An obligation to consider and mitigate GHG emissions on a global scale is a departure from the traditional use of the SEPA tool, which is meant to consider local impacts. We are unaware of any other project proposal that has been tasked with global evaluations, or to undertake such mitigation.

The proposed accounting and mitigation is precedent setting. Precedent for new obligations under our state's Environmental Policy Act should not be established on a project-by-project basis. Doing so will surely cast a dim light on economic prosperity for our state.

Furthermore, current GHG limiting rules, including the state's GHG RACT Rule and the Emission Performance Standards, referenced in the draft-EIS, only require evaluation of project specific impacts, not a global review. In fact, Ecology just released a rule that would put a cap GHG emissions within the state. The authors of that rule are on record regarding limitations the state has in regulating emissions beyond the state's boarders.

If the current review of the proposed MBT-Longview project results in new precedent to review global emissions, we are concerned about what this process will mean for other proposed projects of statewide significance. Will they too face lengthy delays and requirements to mitigate for impacts outside their projects proposals? This sends the wrong message to potential opportunities for economic growth.

The DEIS also relies on life-cycle analysis model to determine the scope of emissions that will be counted against the MBT-Longview project. The co-lead agencies appear to have overlooked a preferred life-cycle model that shows environmental benefit resulting if the MBT-Longview moves forward, in favor of a model that is more detrimental. We would encourage the co-lead agencies to reconsider which model they use. Calling for mitigation for emissions not directly associated with the proposed project fails not only to consider current law, but also ignores GHG emission leakage issues. Every GHG emissions program, including the state's recently released carbon cap rule, takes into consideration the consequences of emissions leakage.

Finally, we fervently believe that this project should be reviewed with a policy lens that is commodity neutral. The addition of the MBT-Longview project increases our position to be globally competitive in the delivery of many commodities, not just one. Singling out a commodity, coal, ignores the strategic position of this terminal as a full-service bulk facility. Agricultural products, timber and many other bulk products will seek to take advantage of a strategically located facility. A commodity neutral review would have likely lessened the timeline of review and unnecessary delay.

As Washington state continues to recover from a slowed economy, we deserve and require timely review of all projects. Instead of imposing new and unprecedented regulations on the employer community, our leaders should be encouraging responsible growth. We need a diverse economy in which everyone – in every corner of the state – has the opportunity to prosper.

Kris Johnson
President
Association of Washington Business

Bill Briggs
Oil Re-Refining Company, Inc.

Blair Buchanan
Allweather Wood LLC

Paul Noe
American Forest & Paper Association

Bill Perdue
American Home Furnishings Alliance

Lora Butterfield
Fife Milton Edgewood Chamber

Colin Hastings
Pasco Chamber

Mark Stiffler
Alcoa, INC

George Sevier
Sam Sevier LLC

David D'Hondt
AGC of Washington

Paul Poister
Agrium U.S., Inc.

Laura Skaer
American & Exploration Mining Association

John Stuhlmiller
Washington Farm Bureau

Sheri Call
WA Trucking Association

Douglas Morrison
Environmental Law Northwest

Tony Umek
Gale-Rew Construction, Inc.

John McLaurin
Pacific Merchant Shipping Association

Ian Talleson
Northwest Food Processors Association

Greg Anderson
Design Service Corporation

Charlie Conner
Conner Homes

David Lucke
BSC Group, Inc.

Scott Madison
Intermountain Gas Company

Kevin Rasler
Inland Empire Paper Company

Betty Capestany
Bellevue Chamber

Dallin Brooks
Western Wood Preservers Insittute

Darryll Olsen, Ph.D.
Columbia-Snake River Irrigators Assn

Submission Number: ***TRANS-LV-M1-00040***

Received: 5/24/2016 12:00:00 AM
Commenter: Brendan
Organization: Association of Washington Business
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Brendan (inaudible) with the Association of Washington Business in Olympia. Where the state's Chamber of Commerce and Manufacturing Association here on behalf of our 8,000 members, employers, and 700,000 employees across the state. AWB and the broader business community supports the Millennium project and the coal export facility. We're a trade-dependent state with growth opportunities through projects with state-wide significance. And we expect fair and timely evaluation of all proposed projects. While we appreciate your work thus far, we are concerned that the Draft EIS that's been prepared by the co-lead agencies related to your emissions work. The draft analysis and review has significant environmental impacts contemplates and requires mitigation for greenhouse gas emissions that are beyond the boundaries of this project and the state. And obligation to consider and mitigate greenhouse gas emissions on a global scale is a departure from the traditional SEPA tool, which is meant to consider local impacts. We are unaware of any other project proposal that has been tasked with global evaluations or to undertake such mitigation. President for new obligation under our state's Environmental Policy Act should not be established on a project-by-project basis. Doing so will surely task economic life on prosperity for our state. Furthermore, current greenhouse gas limit rules, including the state's greenhouse gas WAC rule and the emissions performance standards referenced in the Draft EIS only require evaluation of the project's specific impacts, not a global review. In fact, currently Ecology is writing a rule for a carbon cap in Washington state due out any day. It will attempt to put a cap on greenhouse gas emissions within the state. The authors of that rule are on record of regarding the limitations the state has in regulating emissions beyond the state's boundaries. In closing, regarding mitigation of global emissions sets a new precedence by the state evaluating projects. One that if adopted should also apply to evaluation of the rules developed by the same agency setting the precedence. Thank you.

Submission Number: ***TRANS-PASCO-M1-00061***

Received: 6/2/2016 12:00:00 AM
Commenter: Chris Johnson
Organization: Association of Washington Business
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon, ladies and gentlemen. My name is Chris Johnson. It's my privilege to serve as the president of the Association of Washington Business. AWB represents 8,000 employers in the state if Washington who employ over 700,000 Washingtonians. We're proud to be here to support the Millennium Bulk Terminal for a number of reasons.

One, it will strengthen our ability to export our products not only across the country, but across the globe. Not just agriculture, but other great products such as apples, wheat, hay, and other items as well as timber and other commodities.

This will create important blue collar jobs in a part of our state that really needs them, a part of our state that has chronic unemployment. These are blue collar jobs that are in fierce competition throughout the state and country as well.

Literally 40 percent of all jobs in our state is tied to trade. This is a critical project to advance our economy, to connect our economy throughout the Northwest, to ports across the globe, it's a competition to have throughout the country.

We are building a foundation of trade and we need to grow on that, but we were in competition with countries for those products, with those demand. The question is: If not here, where?

If we speak specifically about this project, it's important to realize that other employers are looking to stay relevant to the certainty and predictability that it requires when you build a new project.

We're four years into this project, the scoping process. We need to send the message to not only current employers and their employees but companies outside this state that we're open for business, that we have a timely review process on our permits and we have a consistent and reliable regulatory environment as we move forward.

We're concerned about the apparent overreach of this Draft EIS. We are unaware of any other proposals that have been required to mitigate for greenhouse gas emissions that will occur on the other side of the globe. We need a diverse economy in which everyone can prosper.

Thank you.

Submission Number: ***TRANS-LV-M2-00080***

Received: 5/24/2016 12:00:00 AM
Commenter: Jenny Holmes
Organization: At Home Ministries of Oregon, Environmental Director
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

SPEAKER 73: Thank you for this opportunity to testify this evening. My name is Jenny Holmes (phonetic). I'm the environmental ministry director for At Home Ministries of Oregon, which is a statewide association of congregations, denominations, and ecumenical, and interfaith organizations.

And I'm here to share some excerpts of a resolution of board of directors passed in December of 2015. It's called New Fossil Fuel Export Infrastructure, A Call For a Higher Road For The Pacific Northwest. And, in general, we oppose any new fossil fuel infrastructure construction in the Pacific Northwest. And therefore we are opposed to the bulk Millennium coal terminal.

The Pacific Northwest is a special place of beauty and natural abundance from deserts to shorelines along the Pacific Ocean. From mountains to fertile valleys, we are blessed by the Creator to call this place home.

For over two decades the idea of the Pacific Northwest, serving as a global model of a green ecology that supports both people and nature has been an inspiration to many throughout the world. Whereas among people of faith a vision for the well-being of humankind together with nature has been expressed as shalom or ecojustice.

And more recently by Pope Francis in his encyclical and integral ecology, which connects care of the natural world with justice and well-being for people, especially the most vulnerable. The push by the fossil fuel industry to turn our lands and waters into sacrifice zones for the export of fossil fuel including coal threatens much that we value.

The Pacific Coast from British Columbia to California stands between large deposits of fossil fuel in the North American interior and Asian markets, a cultural and moral shift in how fossil fuels are viewed and new policies to limit pollution from burning of fossil fuels has fueled a search for new markets. We oppose this project.

Thank you very much.

A Washington State Chapter of the National Audubon Society
P.O. Box 2524, Olympia, WA 98507
(360) 352-7299 www.blackhills-audubon.org

Black Hills Audubon Society is a volunteer, non-profit organization of more than 1,300 members in Thurston, Mason, and Lewis Counties whose goals are to promote environmental education and protect our ecosystems for future generations.

June 12, 2016

The Black Hills Chapter of the National Audubon Society (BHAS) is an all-volunteer-based, non-profit organization whose 1,300 members share interests in birds and other wildlife, their habitats, and natural history. Our goals are to promote environmental education and recreation and to maintain and protect our ecosystems for future generations.

We recommend the "No Action" alternative for Millennium Bulk Terminals' proposal to build a coal export terminal in Longview, WA. Our opposition arises in four main areas:

1. **Health dangers of coal dust** including exposure to residents as well as to coal-industry employees to toxic heavy metals like mercury and increased rates of chronic bronchitis, emphysema, and COPD, as well as for asthma especially in children. The Dept. of Ecology acknowledges that moving over 44 million tons of coal in uncovered trains and stockpiling it along the Columbia would harm people's health and the river. In particular, the Health Impact Assessment agreed upon in June 2015 is missing from the DEIS.

2. **Increased burning of coal** in Asian nations, facilitated by transport from the US, thereby **increasing the carbon emissions that generate global warming** and prolonging the world's transition to cleaner alternatives. In turn these effects result in more forest fires, more flooding and lost agriculture, forestry and fishery revenues.

3. Likely **disproportionately high impact on low-income and minority communities**, which are clustered near the proposed terminal location.

4. **Adverse effects on wildlife**. The rail and vessel corridors servicing the proposed coal export terminal support habitats of critical importance to a variety of bird species. The Columbia River Estuary represents prime stopover habitat for migratory shorebirds and waterfowl within the Pacific Flyway. The western extent of the estuary is a designated Western Hemisphere Shorebird Reserve Network site that supports large numbers of shorebirds during migration.

The DEIS states that there may be adverse effects on birds such as Bald Eagle, Peregrine Falcon, Vaux's Swift, and several waterfowl species including Barrow's Goldeneye from coal dust deposited from the coal terminal project during operations.

Three of these species are on the at-risk list of 189 birds in Washington State identified in the National Audubon Society's *2014 Birds and Climate Change Report*.

In summary, we believe that the DEIS fails to address adequately many of the concerns about the proposed coal export terminal at Longview and as it stands the findings in the DEIS do not bode well for the coal terminal. We recommend "No action."

Thank you for the opportunity to comment on the proposed coal export terminal.

Sincerely,

Samuel Merrill, Chair, Conservation Committee
Black Hills Audubon Society

Submission Number: ***TRANS-SPOKANE-M2-00007***

Received: 5/26/2016 12:00:00 AM
Commenter: Del Eakins
Organization: Brotherhood of Local Engineers and Trainmen
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good evening. My name is Del Eakins, and I've was born and raised and now work in Spokane.

I'm here representing the Brotherhood of Local Engineers and Trainmen, and show our support for the Millennium Bulk Terminal.

Washington state (inaudible) seven percent of U.S. exports and six percent of all (inaudible) provided to our economy providing living wage jobs. With this in mind, it is imperative that Washington state continues to move forward by supporting projects like the Millennium Bulk Terminal.

From Boeing to agriculture trade, which drives the states economy, it is imperative we don't get held up on single issues that can be detrimental to our economic future.

The Millennium Bulk Terminal is a facility that will handle coal in the most environmentally friendly manner, will be a driving force of Washington's economy.

Having a modern terminal that can readily ship commodities like wheat and barley, or corn and soy beans from the Midwest, allowing our state to compete with the new larger ships to pass through the Panama Canal into the Gulf.

But for me the Millennium Bulk Terminal is good for both our state and shows the world that Washington continues to be a gateway for international trade and a strong economic force. Thank you.

Submission Number: ***TRANS-PASCO-M1-00059***

Received: 6/2/2016 12:00:00 AM
Commenter: Sherif Elam
Organization: Brotherhood of Locomotive Engineers and Trainmen in Washington State, Chairman
State: Oregon

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Hi. My name is Sherif Elam (phonetic). I'm the chairman of the Brotherhood of Locomotive Engineers and Trainmen in Washington state, I'm a resident in Oregon. I represent over 900 members from our state.

We support the Millennium Bulk Project Terminal in Longview, Washington as it will repurpose the Longview's industrial infrastructure of former Reynolds Aluminum plant creating an additional means for our state to remain competitive with trade in foreign markets into the 21st century.

I have visited this location. I was provided a thorough understanding of the intended process to export local coal from the Powder River Basin base to the end market of Japan, Taiwan, and South Korea, all of which will make significant investments to monitor the burning of coal in a responsible manner in addition to deactivations of outdated coal-fired industry plants.

The development of this facility will benefit our state greatly in a multitude of ways. Along with allowing for our presence to be felt in these countries, we'll have additional presence in the voices from our citizens and we will be front runners for responsible mining, the reduction of emissions in the transport of coal and to further monitor particulate released into the atmosphere from burning coal as we continue to advocate the need for renewable resources into the future.

My fellow citizens, please understand that if we want to be a player we must stay in the game. We have the ability to be directly connected to the process holding all accountable for the responsibilities of (inaudible) that has allowed for the advancement of our open great nation. God bless America.

Thank you.

CHAMBER of COMMERCE
CAMPBELL COUNTY

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June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Millennium Bulk Terminals-Longview Proposed Action – Public Comment

Dear Review Team:

As you know, Millennium Bulk Terminals-Longview, LLC (Millennium) is proposing to construct and operate a marine terminal for export of coal in Cowlitz County, Washington. The Cowlitz County Department of Building and Planning and the Washington State Department of Ecology are working cooperatively as co-Lead Agencies for the Environmental Impact Statement (EIS), which is required for this project. The following comment letter is being submitted on behalf of the Campbell County Chamber of Commerce.

The Campbell County Chamber of Commerce, located in northeast Wyoming, serves as the voice of business for its 650 members. The region enjoys a strong economic base underpinned by energy development. Coal produced in the region reliably fuels affordable electricity generation in 30 states across the nation. The coal industry is critical to Wyoming. Following last month's devastating round of layoffs, the industry still employs nearly 6,000 individuals directly with a payroll of nearly $700 million and more than 2,000 contractors. The average coal mining job pays over $83,000 per year, well above the state average. And every coal mining job supports another 2-3 jobs in the service and supply industry. Wyoming mines produced over 375 million tons of coal last year, and the financial contribution to state and local governments in the form of taxes, royalties and fees was approximately $1 billion. Wyoming's share of federal mineral royalties, royalties paid to mine the leased coal, was over $200 million.

The Millennium proposal should be commended for the vision to reclaim an industrial site going unused, to make way for a safe and productive import-export facility. These activities have already improved the environment and will provide stable family-wage jobs and vital tax revenue for Longview and both Wyoming and Washington state.

The notion that a commodity like coal can be singled out for its carbon footprint, while not applying that same measuring stick to every transportation project built in Washington, every new office or school building under construction, or other commodities shipped internationally, is simply unfair and illogical. Powder River Basin low sulfur coal is among the cleanest coal on earth and is a necessary part of the fuel load that needs to power humankind's growing electricity needs from hospitals to schools to factories that return products to the United States for consumption.

Thank you for considering our comments on this project. Please contact us with any questions or concerns you may have.

Sincerely,

Charlene Murdock
Executive Director

Submission Number: ***TRANS-PASCO-M2-00008***

Received: 6/2/2016 12:00:00 AM
Commenter: BC Smith
Organization: Central Washington Building Construction Trade Council
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good afternoon. My name is BC Smith. I'm with the Central Washington Building Construction Trade Council. The Council supports 100 percent the work at the Millennium terminal.

I was here three years ago and testified in support of this facility and this means hundreds of good building trade jobs for several years and plenty of operating jobs for years after that.

We have to look beyond some of the things that are tying us down. The environmental assessment has been done. I would encourage a yes vote to push this project forward.

We're ready to do it. It's the right time, it's the right place. Let's get it done. Thank you.

Submission Number: ***TRANS-SPOKANE-M2-00005***

Received: 5/26/2016 12:00:00 AM
Commenter: Tom Melkey
Organization: Chamber of Commerce & Economic Development Organization, Greater Spokane Incorporated
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good evening. My name is Tom Melkey, from Spokane, I am the CEO of Greater Spokane Incorporated, the region's Chamber of Commerce, and Economic Development Organization.

As we think about this project and we are here speaking, I'm here speaking on behalf of my organization in support of this project.

As we look at this project, we recognize that 95 percent of the consumers in this world live outside the United States. We also recognize that 83 percent of the world's disposable income is outside the United States.

And because of those conditions, Washington state becomes the gateway for the nation. Forty-six U.S. states rely on Washington ports to export their products, and 70 percent of the goods coming through our ports inbound move to the rest of the nation.

This sets stage for the importance of Washington state when it comes to international trade. We are the most trade-dependent state in the nation.

We see more than a 116 billion dollars in total exports. Forty percent of the jobs in Washington state are tied to international trade, and these jobs typically without doubt have higher wages than non-trade jobs.

And 90 percent of the exporting companies are small and medium size enterprises. We say this because it sets the stage that when we talk about moving these goods and moving these products, we need to look at the most sufficient means of moving those goods and products as possible.

As a former legislator on the Transportation Committee, we know very well that roads are subject to the wear and tear and they're very expensive, and we do have fuel consumed and the emissions from diesel trucks. Rail is much more efficient.

This port has the ability to set, as I recognize it, not just (inaudible) on coal but to also handle other product. And because of that it becomes an extremely important part of our infrastructure for this state.

So with that I do hope that you'll move forward and improve this project. Thank you for your time.

Submission Number: ***TRANS-SPOKANE-M2-00014***

Received: 5/26/2016 12:00:00 AM
Commenter: Gloria Clark
Organization: Citizens Alliance for Property Rights
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hello. My name is Gloria Clark. I'm from Spokane, born and raised here. I'm also the secretary of CAPR, Citizens Alliance for Property Rights. And we have 15 chapters in Washington state and four in California. And our chapter in Spokane and other chapters are taking a stand in favor of the terminal -- or of the Millennium Bulk Terminal there.

I'm kind of an interesting person because I'm married to a pipefitter, and he is a union pipefitter. And he went down and talked to the business agent, and they were in favor of that. So this is not a partisan issue. This is keeping our jobs in America, keeping our kids staying here in America, it's keeping our standard of living up.

I mean, if we don't have private property we don't have the means of wealth. If we don't have jobs, we will not be able to support ourselves. The government will have to support us that's ridiculous.

In fact, in the Spokane Valley, the median income the Spokane Valley in 2008 was 56,000, and now it's down to 48,000. If we don't start bringing up good jobs again and standing up for unions and pipefitters and all the other jobs that are going to be afforded, then we're going to be living in a substandard country, in a country like maybe -- well, maybe a socialist country that you'd want to, and maybe 30 percent of the people work. I really would like to see everybody working if their able to.

And I just think we have to also utilize our natural resources. We live in a country that is abundant. I think God has given us these natural resources and we're sort of thumbing our nose at him and saying, we're just going to sit here and do nothing. We're not going to utilize these resources that you've given us. And I think we need to work together. This is a wonderful opportunity the Republicans and Democrats to come together. Thank you.

CITIZENS FOR SENSIBLE TRANSPORTATION PLANNING
www.walkspokane.org

John Covert
811 W 24th Ave
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I am the President of **Citizens for Sensible Transportation Planning**, a 501(c)(3) non-profit and submit the following comments on behalf of my organization regarding the Millennium Bulk Terminals-Longview SEPA Draft Environmental Impact Statement.

The Draft EIS identifies numerous unavoidable and significant adverse environmental impacts that will remain for nine environmental resource areas: social and community resources; cultural resources; tribal resources; rail transportation; rail safety; vehicle transportation; vessel transportation; noise and vibration; and greenhouse gas emissions. Significant impacts from just one of these resource areas should be enough to derail this permit process. Identifying nine separate areas that will have unavoidable adverse impacts is a mandate to stop this dangerous project from moving forward.

In the Summary document, on page S-42, under the section labeled S.7.6 the document discusses how the Proposed Action will have unavoidable and significant adverse impacts on vehicle transportation in Cowlitz County. This section needs to be expanded to document that adverse conditions will also develop in Spokane County as we have at least 25 at grade crossings which will experience the same volume of trains moving through Spokane as will move through Cowlitz County on tracks that section S.7.4 on page S-41 has identified as not having capacity to handle the increased rail traffic and will experience unavoidable and significant adverse impacts.

Vehicle Transportation, 6.3.3.3, discusses potential cumulative impacts on vehicle transportation. A detailed, quantitative, analysis was conducted in the Cowlitz County area, but only a qualitative, cursory analysis was conducted for Spokane County. Even though train volume is going to go from the current 70 trains a day to a projected 200 trains per day in 2038 (see below) in the Spokane Corridor. This near tripling of train volume will create significant additional vehicle delay at these at grade crossings without accounting for increases in vehicle congestion that is going to occur on these roads during the next 20 years. In Spokane County, on just the BNSF rail line to Pasco, there are 25 “at Grade” crossings. The average daily traffic

count for these roads is currently more than 51,000 cars per day. A significant portion of this traffic volume will be subjected to increased congestion for so many minutes per day as the additional train volume traverses the county. Over the course of a year, this will cost Spokane County drivers millions of dollars in increased congestion costs. The increase in traffic congestion created by the additional trains being added to the existing rail network needs to be identified and properly mitigated. Transportation projects under construction in just Spokane County are spending billions of dollars to add capacity to the transportation road grid and these coal trains are going to increase traffic congestion on dozens of arterials that cross rail lines at the "at Grade" crossings. The deis needs to do a quantitative analysis of these traffic impacts for the Spokane area.

On the Idaho/Washington stateline to Spokane BNSF line segment, current daily track volume is 70 trains per day and capacity is 76 trains per day. The tracks are basically at capacity without the addition of extra coal trains for the MBT project nor the unit oil trains for the Tesoro Oil terminal in Vancouver. Adding all of this proposed additional rail traffic will exacerbate the rail capacity problem to an unsafe level. On the Spokane to Pasco rail segment, current volume is 39 trains per day and capacity is 37 trains per day. The line is already beyond capacity without the MBT and Tesoro project volumes. Table 6-6 on page 6-37 estimates rail traffic volume for the year 2038 in Spokane will be 184 trains per day without the MBT and 200 trains per day with the MBT! All of this rail traffic funneling through a corridor with a capacity of 76 trains per day. A ludicrous proposition. Rail traffic through the Spokane Valley will basically triple compared to current conditions if all of the projected rail volume develops over the next 20 years, driven by the multiple proposals for export terminals to move fossil fuels halfway around the planet.

An article in the journal Atmospheric Pollution Research in May of 2014 presented the results of their study to evaluate the air quality implications of rail traffic. The results show that living close to the rail lines significantly increases PM2.5 exposure (see Figure 3). As rail traffic increases, residents close to the rail lines will see their air quality decline. Why don't the results in the deis reach similar conclusions for their PM2.5 analysis as the research presented in the journal article?

The deis did an analysis of Estimated Maximum and Average Monthly Coal Dust Deposition in both Cowlitz County (Table 5.7-7) and in Washington state outside of Cowlitz County (Table 5.7-10). The analysis shows that at a distance of 100 feet, the maximum monthly deposition exceeds the trigger level for sensitive receptors inside Cowlitz County but doesn't outside of Cowlitz County. This doesn't make sense. The same trains travel over the same range of speeds throughout the entire state. How did the analyses produce different results? The discrepancy needs to be explained.

Mitigation measures proposed to alleviate impacts can't be speculative and unenforceable. They must be relevant and actually resolve the problem. Creating a reporting process (MM CDUST-2) so people can report coal dust complaints doesn't mitigate for the coal dust impairment. Applying surfactant in Pasco (MM CDUST-3) doesn't solve a coal dust problem in Spokane. Attending one meeting a year (MM CDUST-4) to discuss concerns doesn't solve coal dust impairment. Telling BNSF that they should conduct a dust monitoring study (5.7.7.3) when they aren't the entity receiving the permits in the deis in unenforceable.

The unavoidable, adverse environmental impacts that can't be mitigated make it imperative that permits needed to construct this export terminal project must be denied and the proposed action must never be allowed to be constructed. This project is not good for the greater Longview community, the entire rail corridor through Washington state (including the Spokane area where CSTP is located), the entire rail corridor beyond the state border, and ultimately the world community which would annually see 3.2 million metric tons of CO_2e emissions added to atmosphere (Table 5.8-8). This would be occurring during the timeframe when 195 countries agreed to work towards reducing greenhouse gas emissions at the Paris Accord.

Figure 3, Excerpts from a publication in Atmospheric Pollution Research 5 (2014) 344-351

Atmospheric Pollution Research 5 (2014) 344-351

Atmospheric Pollution Research

www.atmospolres.com

Diesel particulate matter emission factors and air quality implications from in–service rail in Washington State, USA

Daniel A. Jaffe [1,2], Greg Hof [1], Sofya Malashanka [1,2], Justin Putz [1], Jeffrey Thayer [2], Juliane L. Fry [3], Benjamin Ayres [3], Jeffrey R. Pierce [4]

[1] *University of Washington–Bothell, School of STEM, Bothell, WA USA*
[2] *University of Washington–Seattle, Department of Atmospheric Sciences, Seattle, WA USA*
[3] *Reed College, Department of Chemistry, Reed College, Portland, OR USA*
[4] *Colorado State University, Department of Atmospheric Science, Fort Collins, CO USA*

"Our measurements of PM2.5 show that living close to the rail lines significantly increases PM2.5 exposure. For the one month of measurements at the Seattle site, the average PM2.5 concentration was 6.8 µg/m3 higher near the rail lines compared to the average from several background locations. Because the excess PM2.5 exposure for residents living near the rail lines is likely to be linearly related to the diesel rail traffic density, a 50% increase in rail traffic may put these residents over the new U.S. National Ambient Air Quality Standards, an annual average of 12 µg/m3. "

"Figure 3 shows a time series of PM1 (µg/m3) and CO2 (ppmv) concentrations for a 6–hour period at the Seattle site. We define a "train event" as a single spike or enhancement in PM and CO2 that is confirmed by the video images. During the period shown in Figure 3 we identified 8 train events."

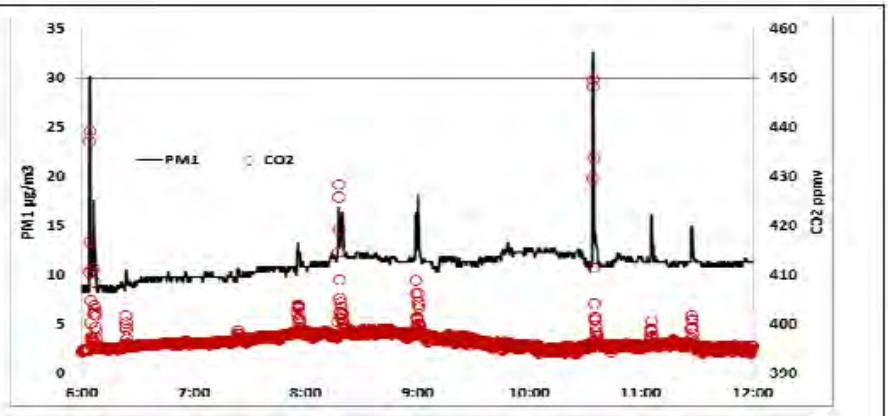

Figure 3. *PM_1 (µg/m³) and CO_2 (ppmv) data (10-second averages) from the Blue Ridge site for July 25, 2013, between 06:00 and 12:00 local time. During this period, we identified 8 trains from the atmospheric data and confirmed by video images.*

The "site was located in the residential Blue Ridge (BR) neighborhood (47.70°N, 122.40°W), in the City of Seattle, approximately 10 km north of downtown. The instruments and camera were housed on the patio of a residence, which is approximately 25 meters from two active rail lines. The rail lines are immediately adjacent to the shores of Puget Sound and there are no roads in this direction before the shoreline. A video camera was co–located with the instrumentation

Millennium Bulk Terminals-Longview SEPA Environmental Impact Statement
Comment Letter from Health Professionals

As health professionals we welcome the opportunity to comment on the the Millennium Terminal EIS. The draft report underestimates both the magnitude of harmful emissions and their impact on human health. We disagree with the report's findings of no significant impact on climate and air quality.

CHOICE OF SCENARIO

By designating the 2015 scenario as “preferred” the EIS minimizes the amount of coal that could be burnt. This upstream error leads to downstream underestimations of climate and air quality impacts. The scenario assumes that the Clean Power Plan is in effect and that the US will keep its Paris commitments. In reality Clean Power Plan is suspended by the courts and its fate, along with other EPA actions, and US adherence to the Paris climate accord will depend on the result of a presidential election between climate denying and climate proactive candidates who are currently neck and neck in public opinion polls. (Cho, 2016)

The Upper Bound scenario, which has no Clean Power Plan or American leadership on climate change, is described by its authors as also “plausible”, is just as likely as the 2015 scenario, and creates twelve time more greenhouse gas emissions. Since things could go either way, the stakes are high, and the consequences irreversible, the Upper Bound scenario is the safer choice on which to base estimations of possible impact.

CLIMATE IMPACT

It is hard to understand how greenhouse gas emissions from the project can be deemed significant and unavoidable while the climate change they cause is not.The EIS fails to adequately consider the effect of climate change on air and water quality and environmental justice. Higher temperatures increase ozone formation, drought and dust storms increase PM10, and wildfires generate concentrations of ozone and PM2.5 which are higher than the worst urban air day. Climate change also increases toxic algae blooms, storm runoff of PCBs and heavy metals, and sewage overflows (USGCRP, 2016) (Jackson, 2010). All of these impacts disproportionately impact minority and low income people. We suggest that impacts on climate, air and water quality be revised to reflect current political uncertainty and indirect impacts.

COAL DUST

To assess the environmental impact of coal dust, this EIS relies heavily on a draft EIS of the Tongue River Railroad which was never finalized due to withdrawal of the permit request. Much of the chapter on coal dust in the Millennium report is lifted verbatim from the Tongue River draft without attribution. Fugitive coal dust increases with wind and is inversely related to days of rainfall so there is reason to suspect that conclusions about one location may not apply to another. A partially completed environmental review of another project in another state by another agency is an inadequate basis to determine the safety of transporting coal by train through Washington.

What we do know about coal dust in the Washington context is that a published peer reviewed study of coal trains in the proposed rail corridor showed short term increases in PM2.5 at levels known to cause adverse health effects (Jaffe, 2015). Short term spikes in PM2.5 from coal trains have been described elsewhere in the literature (Kane, 2015). Since BNSF policy has required coal loads to be topped since

2011, Jaffe's measurements in 2014 suggest that topping is either ineffective or the railroad is incapable of ensuring compliance. We recommend that WDOE independently review fugitive coal dust studies and the literature on the health impact of short term PM2.5 exposure, consider them in the context of areas prone to drought and high winds, and formulate their own conclusions.

Thank you for the opportunity to comment on this EIS.

Submission Number: ***TRANS-SPOKANE-M2-00062***

Received: 5/26/2016 12:00:00 AM
Commenter: Vlad Duggan, Director
Organization: Climate Solutions
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Thank you for giving me the opportunity to speak today. My name is Vlad Duggan, I'm the Washington Director for Climate Solutions.

We strongly oppose the Millennium project. While we appreciate the significant effort that went into the drafting this DEIS, we'd like to identify some concerns.

Facilitating coal export to Asia will be to reduce prices for coal there and increased usage. We do not agree that the exports will turn significantly upward pressure on domestic coal prices in the United States, (inaudible) the transition away from its use.

As we've seen in, for example, closer to Montana where coal is mined and used for electricity, there's a rapid transition away because of the poor economics of those plants. And the federal power plant will further accelerate and make law that transition to other parts of the country.

That means the demand for coal is collapsing due to exogenous reasons, and so it would be unresponsive to coal exports out of Washington.

This means that while there will be lower prices and stimulate demand elsewhere, we will not see offsetting reductions here.

The substantial increase in rail traffic with the DEIS does an inadequate job of analyzing the cost and impacts, it will also leave substantial emissions from the diesel emissions the trains rely on.

This runs contrary to the work that the Department of Ecology is doing elsewhere in the Clean Air Rule to reduce emissions consistent with state mandated reductions rules passed in 2008, increasing diesel emissions diametrically opposed to those goals.

And while the report claims (inaudible) impact from coal dust, this (inaudible) conflicts with the experience that shows (inaudible) just don't work over long distances.

In the next version of the DEIS we urge you to consider not just models for coal dust but also the lived experience of the communities that deal with coal trains every day. Thank you very much for your work and for your participation.

THE COLUMBIA RIVER BAR PILOTS

Providing Safe Passage *Since 1846*

June 9, 2016

Millennium Bulk Terminals EIS,
c/o ICF International,
710 Second Avenue,
Suite 550,
Seattle,
WA 98104

Re: Millennium Bulk Terminals – Longview project DEIS

Dear Sir or Madam:

This letter provides the comments of the Columbia River Bar Pilots on the Draft Environmental Impact Statement for the Proposed Millennium Bulk Terminals – Longview project. The Columbia River Bar Pilots are an organization of 17 state-licensed pilots who are responsible for piloting ocean-going vessels transiting the Columbia River Bar pilotage ground that covers a distance of approximately 25 miles from the Columbia River entrance in the Pacific Ocean to Tongue Point just east of Astoria. The history of the Bar Pilots dates back more than 200 years. Bar Pilots were among the first professionals of any kind to be licensed by Oregon's territorial government more than a decade before statehood in 1859. Historically, the Bar Pilots have played a key role in the development of commerce on the Columbia/Snake River navigational system and have an enviable record of success in safely guiding ships through a river entrance that is universally acknowledged as one of the most dynamic and dangerous in the world.

The Bar Pilots' enviable safety record is a function of the group's tradition and dedication to stringent licensing requirements. While a common requirement in other parts of the world, the Columbia River Bar is the only pilotage ground in the United States where applicants must have a minimum of two years' sea time serving as a ship's master or captain while operating under the unlimited license (any ocean and any ton vessel). This licensing requirement has been a matter of regulation since 1940. As a result, the Bar Pilots are drawn from throughout the United States after havi!1g graduated from a U.S. maritime academy and serving 15 to 25 years at sea, working up from an officer position to master.

In addition to stringent licensing requirements, the Bar Pilots have been leaders in adopting new technology to enhance navigational safety. As the size of the average cargo ship more than doubled between the 1960s and the 1990s, the Bar Pilots pioneered the first use of a daughter boat boarding and disembarking system in the Ocean. The helicopter began operations in August 1999 and

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has safely transferred over 35,000 Bar Pilots to and from vessels in the Pacific Ocean for over 18 years with one minor injury accident. The leadership of the Columbia River Bar Pilots in successfully introducing helicopter operations in the United States was recognized by *Professional Mariner* magazine with the award of its prestigious Plimsoll Award recognizing leadership in maritime safety in 2003. Beginning in 2000, the Bar Pilots also modernized their pilot boats to fast, highly maneuverable, jet-powered vessels that started a worldwide trend in pilot boat technology that increases navigational safety and efficiency.

With respect to the draft DEIS, the Bar Pilots has two comments concerning the capacity of the Columbia River navigational system and congestion. Those comments are set out below.

The DEIS in Chapter 5 states that the proposed project would generate a 44% increase over exiting traffic levels. In fact, the proposed project will be served primarily by Handymax and Panamax vessels, which have been calling in the Columbia River for decades and which account for a majority of the bulk carriers taking on grain cargoes on the Columbia River. The Bar Pilots are confident that the Columbia River system can easily accommodate an additional 840 cargo vessels per year. During the six-year period of 1995- 2000, the number of inbound vessels averaged over 2,000 per year. In contrast, the five-year time frame of 2009-2013 has averaged 1475 vessels annually.

It should also be emphasized that the lower Mississippi River system accommodates approximately four times the volume of the volume experienced in the Columbia River. From a navigational safety standpoint, the highly regulated dual pilotage system on the Columbia River, which will require both a river pilot for the transit from Vancouver to Astoria and then a Bar Pilot for the transit from Astoria across the Bar to the Pacific Ocean, has more than sufficient capacity to safely accommodate the additional traffic from the proposed project as demonstrated by traffic and accident statistics over many decades.

·We appreciate the opportunity to present these comments.

Very truly yours,

Captain Dan Jordan

COLUMBIA RIVER BAR PILOTS

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Columbia River Steamship Operators' Association, Inc.

June 8, 2016

Millennium Bulk Terminal EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

Re: Comments of the Columbia River Steamship Operators' Association, Inc. in Response to the DEIS for the Millennium Bulk Terminals-Longview LLC Project

To Whom it May Concern:

The Columbia River Steamship Operators' Association, Inc. (CRSOA), appreciates the opportunity to comment on the SEPA Draft Environmental Impact Statement for the Millennium Bulk Terminals-Longview LLC (Millennium Bulk) project. Established in 1922, the CRSOA consists of members representing ship owners, operators, agents, tow companies and bunkering companies along the Oregon Coast and Columbia/Willamette River Systems. The mission of the CRSOA is to facilitate trade, provide business leadership, exercise principles of environmental stewardship, serve as an industry focal point, and promote operating policies and practices that are safe, reliable, efficient, and cost effective. We believe that Millennium Bulk can safely and efficiently construct and operate the proposed coal export facility and shipping terminal.

Increased vessel traffic is identified as an "unavoidable and significant adverse environmental Impact" due to a potential incident, such as a collision (S.7.7, pg S-42). Recently completed channel deepening of the Columbia River was intended to increase vessel traffic while investments in training and navigational technology by the CRSOA, pilots, and the tug and towboat industry have increased the safety of vessel operations and movements (5.4.4.2, pg 5.4-20). CRSOA is concerned that increased vessel activity is considered a negative impact. 1,377 ships called the Columbia River in 2015, well below the recent high of 2,283, recorded in 2000 (Merchants Exchange). Increased vessel traffic resulting from the proposed project is projected to be below this recent high and unlikely to result in vessel traffic congestion. The Columbia River has the capacity for growth. Not only is the river not being utilized to capacity, but the federal navigation channel's designated purpose is commercial marine traffic and transportation (33 CFR §328.3(a)(1); 40 CFR §230.3(s)(1)). In 2010, the Columbia River was officially designated by the U.S. Department of Transportation and the Maritime Administration as a Marine Highway (M-84)– with a vision to 'ensure that reliable, regularly scheduled, competitive, and sustainable services are a routine choice for shippers' (46 CFR §393.3). Increased vessel activity in the Columbia River is necessary to support continued investments by existing and planned facilities and the maritime service industry that supports them.

The inclusion of alleged greenhouse gas emissions outside of Washington State is both inappropriate and sets a dangerous precedent with respect to any planned expansion of, or newly proposed maritime facility that handles products moving across state and international boundaries (5.8.1.4, pg 5.8-5). The maritime industry that supports Washington state ports continues to make significant investments in improving efficiency and safety with the highest attention to environmental compliance and is concerned about practices that will delay or potentially prevent new maritime terminal developments.

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503-505-3008 admin@crsoa.net www.crsoa.net

Columbia River Steamship Operators' Association, Inc.

CRSOA supports a timely and independent review process. We find this to be paramount to ensuring that other marine terminal developments will continue to consider our region for development and not look to other states and/or countries that are able to provide a more reasonable and certain permitting environment.

CRSOA was one of the founders of the Maritime Fire and Safety Association (MFSA) in 1984 and played a major role in expanding MFSA to include oil and hazardous material spill prevention, response, and mitigation in the early 1990s. We continue to support the MFSA as they provide safe, environmentally responsible, and cost effective response services to commercial vessels in the Columbia Willamette River Marine Transportation System (5.4.4.5, pg 5.4-33; www.mfsa.com). CRSOA has been an industry leader in assisting the state agencies in Oregon and Washington with developing and funding innovative and highly successful spill prevention and response programs.

CRSOA partnered with the Columbia River Pilots and the John A. Volpe National Transportation Systems Center to develop Transview 32 (TV32), a Vessel Traffic Information System (VTIS) for the Columbia River. Using TV32, vessels are able to continually broadcast navigation information to allow users to monitor vessel traffic, manage anchorages, and manage navigation. TV32 enhances the safety of navigation on our river system, thereby increasing transportation system efficiency while decreasing critical encounter situations and the probability of a marine casualty resulting in environmental damage (5.4.4.2, pg 5.4-23). CRSOA has reflected in these actions, a long time commitment to safety and environmental stewardship.

The state of Washington is trade dependent and a critical part of the import/export infrastructure of the West coast. International trade is essential to the economy of Washington and supports many family-wage jobs. Millennium Bulk has put forth a concerted effort to assure that environmental protections are put in place for its proposed import/export terminal. The Millennium Bulk project would be a valuable addition to our regional economy, create jobs, and be an asset to the surrounding communities and the economic outlook of our nation as a whole.

We thank you again for the opportunity to comment.

Respectfully,

Kate Mickelson

Kate Mickelson
Executive Director

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503-505-3008 admin@crsoa.net www.crsoa.net

Submission Number: ***TRANS-SPOKANE-M2-00068***

Received: 5/26/2016 12:00:00 AM
Commenter: Katie Sheehan
Organization: Community Building Foundation
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Hello. My name is Katie Sheehan. I work at the Community Building Foundation. I'm not here on their behalf but I'm telling you that because I work at Community Building, which is -- I'm totally turned around here, but probably that way. It's about a block or two away. And my office looks south, directly onto the coal train line, which is basically what it is.

I look out my office window and I see coal trains go by hour after hour already. And, you know, what's scary is that my three-year-old son is also at the day care center in that building. And I think about him and what his future is going to look like. And I see them pass through our community and they don't add anything except for dust at this point.

They disrupted our community in short term, traffic on the lines and traffic in our town, and I don't see any benefits to Spokane.

They destroy our environment in the long-term though. I do think about investments a lots, and I think that we need to change what the assessment -- or what the definition of risk is. This is a risky investment. It is not a safe investment.

And that's in the long term. And maybe right now it seems like that, but it is not. It's an investment in potential disaster and outright disaster if we continue on this track of greenhouse gas. Thank you.

Submission Number: ***TRANS-LV-M2-00033***

Received: 5/24/2016 12:00:00 AM
Commenter: Bill Marquam
Organization: Council Longview Chamber
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good evening. Bill Marquam. I'm the CEO with the Council Longview Chamber, and I live in Longview, Washington. And Council Longview Chamber and its nearly 500 members are in support of Millennium and the project. And we are in support for a few reasons. But number one, jobs.

And number two, the fact that they have been excellent members of our community. They've been very participatory.

And three, I think, you know, it's an opportunity for jobs in our community, for taxes in our community, but also it's an opportunity for our county and for our state to show that we are open for business.

Thank you.

Submission Number: ***TRANS-PASCO-M1-00069***

Received: 6/2/2016 12:00:00 AM
Commenter: Leanne Barris
Organization: Earth Ministry
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good afternoon. My name is Leanne Barris (phonetic). I'm the executive director of Earth Ministries. And on behalf of faith communities around the state, we urge you to support the no action alternative and to deny the permit for this coal export terminal.

Earth Ministries represents over 500 partner congregations across the state, which is more than 25,000 people of faith. We wrote a compilation at ground zero in Longview, Washington; here in the Tri-Cities; in Walla Walla; in Vancouver; in Spokane; and all along the Columbia River Gorge along the train track where these coal trains will be coming through.

And of people of faith we are concerned about the health and safety of our communities. We're concerned about the coal dust. We heard a doctor earlier talk about the very significant health impact of the coal dust coming off the trains will have especially on our elderly and our children.

As an asthma sufferer myself, I'm concerned about our ability to breathe as this pollution, over 500 pounds of coal dust per car on the 100-car-long train coming through our communities. We're concerned about the length of these trains. These trains are going to be mile-and-a-half long, over 20 minutes per crossing.

If we're talking about 16 trains per day, what's going to happen with our first responders if someone needs to get to the hospital? How are we going to protect the health and safety of our communities?

We're concerned about our neighbors in other parts of the world. In China, the air pollution is horrible. And as other people have already mentioned, as those -- as that comes blowing back across the country, we're going to be forced to breathe that air too. So I urge you to deny this permit.

Thank you.

Submission Number: ***TRANS-SPOKANE-M2-00066***

Received: 5/26/2016 12:00:00 AM
Commenter: Jessica Zimmerly
Organization: Earth Ministry
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hi. My name is Jessica Zimmerly. And I am here representing Earthy Ministry. We're a faith-based organization that stands up for the health of our communities all across Washington state.

And I want to bring up Pope Frances's recent encyclical in which he states, quote, Environmental impact assessments should be linked to a study of working conditions and possible effects on people's physical and mental health, on the local economy, and on public safety.

The Draft EIS shows that coal export in Longview does not meet any of the Pope's criteria. And I'll explain with some personal examples.

So physical health. I've myself heard kids in high air pollution neighborhoods say that they think asthma is just something that everybody has.

Without solving coal dust loss from open cars along the rail route, we are increasing this norm of asthma for our future generations in children.

Mental health. The DEIS states that noise disruption from increased rail traffic would exceed regulatory standards. I've lived close to train tracks and I've experienced how this noise disturbs sleep patterns and reduces quality of life.

The local economy. The Draft EIS fails to address the economic drifts to communities along the train tracks like Spokane.

So what about tribal fishing rights, property values, traffic delay, and limited agricultural use of our train system? Not to mention the cost borne by taxpayers to improve rail Infrastructure.

Public safety. Eleven additional rail-related accident are predicted annually in the DEIS as a direct result of only this project. Lord knows that one loss is too many from one of these accidents.

I teach all across the state on this, and coal trains are always coming up in all different (inaudible.) People of faith know that this project is a step backward. We've got the Pope to back us up. It's all risk, no reward, not to mention that it's my future.

EARTHJUSTICE

June 13, 2016

VIA HAND DELIVERY

ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Columbia Riverkeeper, et al. Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview

To Whom It May Concern:

On April 29, 2016, Co-leads Cowlitz County and Washington Department of Ecology issued the draft Environmental Impact Statement ("DEIS") prepared under the State Environmental Policy Act ("SEPA") for the proposed Millennium Bulk Terminals Longview ("MBT") coal export project. Columbia Riverkeeper, Friends of the Columbia Gorge, Sierra Club, Washington Environmental Council, Climate Solutions, Oregon Physicians for Social Responsibility, Washington Physicians for Social Responsibility, and RESources for Sustainable Communities (collectively, the "Coalition") have reviewed the document and supporting materials closely and submit the following comments. These comments expressly incorporate the expert reports attached to this letter, as well as the exhibits cited herein, copies of which are provided on CD attached to this comment letter.

In light of the major and unavoidable consequences for the people of Longview, rail-line communities, and the Columbia River identified in the DEIS, the MBT project must be denied. SEPA and associated laws provide a more than adequate basis for denying the requested permits for MBT's proposal. Despite some significant shortcomings, detailed below, the DEIS confirms that MBT's operation would threaten public safety, degrade public health, and compromise some of the most important salmon habitat in the continental United States. Even more significantly, although the DEIS significantly understates the project's potential impact on greenhouse gas ("GHG") emissions, it confirms that MBT would be among the state's worst sources of carbon pollution, and would trigger changes in global coal markets that result in substantial increases in coal consumption. The DEIS reveals many significant impacts and risks that, individually and collectively, provide a basis for the Co-leads to deny the project.

At the same time, several elements of the analysis in the DEIS are inadequate, incomplete, or incorrect. In other words, the impacts and risks of chief concern to the public are likely far greater than what are disclosed in the DEIS. Those shortcomings are particularly of concern in sections addressing GHGs, public health, and coal dust pollution. This comment letter explores those shortcomings.

The DEIS must be revised to address its fundamental deficiencies. **Correction of the DEIS's flaws will lead to an even firmer conclusion that this project presents significant, adverse environmental and public health harms and risks that cannot be mitigated.** SEPA itself grants the authority to deny this project on any one of several bases, including GHG emissions, risk of rail accidents, traffic, pollution, human health, and impacts to tribal fishing, among others. The co-lead agencies, and other permitting entities, can use that authority, as well as separate authority from other applicable statutes and regulations, to deny or recommend rejection of this terminal.

I. SEPA PROVIDES THE CO-LEADS WITH AUTHORITY TO DENY THE PERMITS FOR THIS PROJECT

The State Environmental Policy Act ("SEPA") is Washington's core environmental policy and review statute. Like its federal counterpart, the National Environmental Policy Act ("NEPA"), SEPA broadly serves two purposes: first, to ensure that government decision-makers are fully apprised of the environmental consequences of their actions and, second, to encourage public participation in the consideration of environmental impacts. *Norway Hill Preservation and Prot. Ass'n v. King Co.*, 87 Wn.2d 267, 279 (1976).

But SEPA is more than a purely "procedural" statute that encourages informed and politically accountable decision-making. In enacting SEPA, the state legislature gave decision-makers the affirmative authority to condition or even deny projects where environmental impacts are serious, cannot be mitigated, or collide with local rules or policies. This authority, like all government authority, is not boundless: the denial of a project must be made on the basis of policies adopted by the relevant government body in light of significant adverse impacts that cannot be reasonably mitigated. This authority has been exercised relatively sparingly. Indeed, in some cases, decision-makers are unaware that they even have it, and incorrectly believe that as long as proposals comply with all applicable development codes, then agencies have no choice but to approve the project. To the contrary, SEPA, in and of itself, contains the authority to condition or deny environmentally harmful projects.[1]

In adopting SEPA, the state legislature declared the protection of the environment to be a fundamental state priority. RCW 43.21C.010. SEPA declares that "[t]he legislature recognizes that each person has a fundamental and inalienable right to a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment." RCW 43.21C.020(3). This policy statement, stronger than a similar statement under NEPA, "indicates the basic importance of environmental concerns to the people of the state." *Leschi v. Highway Comm'n*, 84 Wn.2d 271, 279-80 (1974). At the heart of SEPA is a requirement to fully analyze the environmental impact of government decisions that have a significant impact on the environment. RCW 43.21C.031(1). Under SEPA, a full environmental impact statement ("EIS") is required for any action that has a significant effect on the quality of

[1] Ex. 1, "The Power to Say 'No': SEPA's Substantive Authority and Controversial Fossil Fuel Projects," J. Hasselman, *Environmental & Land Use Law*, Env'l and Land Use Law Sec. of WSBA, Vol. 41, No. 2, Aug. 2015.

the environment. WAC 197-11-330. Significance means a "reasonable likelihood of more than a moderate adverse impact on environmental quality." WAC 197-11-794.

Under SEPA's governing regulations, a SEPA document must fully evaluate all of the direct, indirect, and cumulative effects of projects. WAC 197-11-060(2)(c). While SEPA itself does not define direct, indirect, and cumulative impacts, NEPA does, and these definitions have been borrowed for use in interpreting SEPA.[2] Indirect impacts are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8(b). Cumulative impacts include "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7; WAC 197-11-060(4)(e) (requiring consideration of cumulative effects in determining whether significance threshold has been crossed); WAC 197-11-330(3)(c) ("Several marginal impacts when considered together may result in a significant adverse impact."). Also important in the context of fossil fuel transportation are impacts with a low likelihood but high consequences, like spills from rail or marine transportation. WAC 197-11-794 ("An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred."). Importantly, the regulations specifically direct that an "agency shall not limit its consideration of a proposal's impacts only to those aspects within its jurisdiction, including local or state boundaries." WAC 197-11-060(4)(b).

The requirement to study indirect impacts associated with fossil fuel terminals is equally clear under SEPA's federal analogue, NEPA. For example, in *Mid-States Coalition for Progress v. Surface Transp. Bd.,*345 F.3d 520 (8th Cir. 2003), the Eight Circuit Court of Appeals agreed that an EIS for a rail project was required to study the potential increased long-term demand for coal that could arise if the project was built. Similarly, in *Border Plant Working Group v. Department of Energy*, 260 F. Supp. 2d 997 (S.D. Cal. 2003), a court invalidated an EIS for power transmission lines because the decision-maker failed to consider the impacts of the operation of the Mexican power plants linked to the lines.[3] Recent EISs for controversial projects like the Tongue River Railroad and the Keystone XL evaluate potential market impacts on fossil fuel production and consumption.

The purpose of SEPA is not to generate this information for its own sake. Rather, the purpose of SEPA is to inform an underlying substantive decision; e.g., whether or not to grant some underlying permit or authorization to take action that potentially affects the environment.

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[2] *See Quinault Indian Nation v. City of Hoquiam*, 2013 WL 6637401 (Shorelines Hearings Board, Dec. 9, 2013) (borrowing NEPA definition of cumulative effects for SEPA analysis of crude-by-rail terminal).
[3] *See also Ocean Advocates v. Corps of Engineers*, 402 F.3d 846, 867-68 (9th Cir. 2005) (requiring EIS for dock construction project to consider "increased vessel traffic" that would be proximately caused by project); *S. Fork Band Council of W. Shoshone v. DOI*, 588 F.3d 718, 725 (9th Cir. 2009) ("The air quality impacts associated with transport and offsite processing of the five million tons of refractory ore are prime examples of indirect effects that NEPA requires to be considered.").

WAC 197-44-400. Accordingly, the information developed under SEPA on indirect and cumulative impacts of fossil fuel projects is intended to inform the ultimate permitting decision.

And on this point, SEPA is explicit. It provides substantive authority for government agencies to condition or even deny proposed actions—even where they meet all other requirements of the law—based on their environmental impacts. RCW 43.21C.060. As one treatise points out, when this premise was challenged by project proponents early in SEPA's history, "the courts consistently and emphatically responded that even if the action previously had been ministerial, it became *environmentally discretionary* with the enactment of SEPA." Richard Settle, SEPA: A Legal and Policy Analysis (Dec. 2014) at §18.01[2] (emphasis added).

Courts have repeatedly recognized that this denial authority exists, even where projects otherwise comply with all relevant applicable codes. Indeed, the Washington Supreme Court explicitly affirmed that "under the State Environmental Policy Act of 1971 a municipality has the discretion to deny an application for a building permit because of adverse environmental impacts even if the application meets all other requirements and conditions for issuance." *West Main Associates v. Bellevue*, 106 Wn.2d 47, 53 (1986). An appeals court similarly affirmed that "counties therefore have authority under SEPA to condition or deny a land use action based on adverse environmental impacts even where the proposal complies with local zoning and building codes." *Donwood v. Spokane County*, 90 Wash. App. 389 (1998). Decision-makers have denied permits under this authority in a number of other contexts, many of which are similar to those of this project.[4]

The complete text of the applicable language is:

> The policies and goals set forth in this chapter are supplementary to those set forth in existing authorizations of all branches of government of this state, including state agencies, municipal and public corporations, and counties. Any governmental action may be conditioned or denied pursuant to this chapter: PROVIDED, That such conditions or denials shall be based upon policies identified by the appropriate governmental authority and incorporated into regulations, plans, or codes which are formally designated by the agency (or appropriate legislative body, in the case of local government) as possible bases for the exercise of authority pursuant to this chapter. Such designation shall occur at

[4] *Polygon Corp. v. City of Seattle*, 90 Wn.2d 59, 69-70 (1978) (upholding denial of high-rise project based on aesthetic, property values, and noise impacts); *Victoria Tower P'ship v. City of Seattle*, 59 Wash. App. 592, 602 (1990) (upholding denial of 16-floor tower and mitigation to 8-floors); *State v. Lake Lawrence Pub. Lands Prot. Ass'n*, 92 Wn.2d 656, 659 (1979) (upholding denial of development of 14-acre parcel because of effects on bald eagles); *Cook v. Clallam Cnty.*, 27 Wash. App. 410, 414 (1980) (upholding permit denial of commercial development in rural area); *W. Main Associates v. City of Bellevue*, 49 Wash. App. 513, 521-23 (1987) (upholding denial of permits based on historic/cultural impacts, view impacts, shadow impacts, traffic impacts, and air impacts).

> the time specified by RCW 43.21C.120. Such action may be conditioned only to mitigate specific adverse environmental impacts which are identified in the environmental documents prepared under this chapter. These conditions shall be stated in writing by the decision maker. Mitigation measures shall be reasonable and capable of being accomplished. In order to deny a proposal under this chapter, an agency must find that: (1) The proposal would result in significant adverse impacts identified in a final or supplemental environmental impact statement prepared under this chapter; and (2) reasonable mitigation measures are insufficient to mitigate the identified impact. Except for permits and variances issued pursuant to chapter 90.58 RCW, when such a governmental action, not requiring a legislative decision, is conditioned or denied by a nonelected official of a local governmental agency, the decision shall be appealable to the legislative authority of the acting local governmental agency unless that legislative authority formally eliminates such appeals. Such appeals shall be in accordance with procedures established for such appeals by the legislative authority of the acting local governmental agency.

RCW 43.21C.060 (emphasis added); *see also* WAC 197-11-030(1) ("The policies and goals set forth in SEPA are supplementary to existing agency authority."). This authority is amplified in Ecology's SEPA regulations, which lay out additional procedures and requirements for conditioning or denial pursuant to SEPA's substantive authority. WAC 197-11-660. For example, in order to deny a proposal under SEPA, an agency must find that "reasonable mitigation measures are insufficient to mitigate the identified impact." WAC 197-11-660(f)(ii). Cowlitz County has also adopted explicit code provisions laying out its authority to deny or condition projects. CCC 19.11.110 ("Under RCW 43.21C.060 and WAC 197-11-660, Cowlitz County is allowed to condition or deny proposals if such decision is based upon policies that have been identified and incorporated into regulations, plans, or codes formerly designated as possible bases for the exercise of substantive authority under SEPA.").

In short, the Co-leads have the discretion to deny this project under SEPA, as long as: (a) the denial is based on an appropriate policy; (b) the agency finds that the project would result in significant adverse impacts; and (c) "reasonable mitigation measures" cannot mitigate those impacts. These criteria are satisfied here.

Cowlitz County has specific policies to implement this substantive authority, and they are sweeping indeed. They include the duty to use all practicable means to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations"; to "[a]ssure for all people of Cowlitz County safe, healthful, productive, and aesthetically and culturally pleasing surroundings"; and to "[a]ttain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended

consequences." It also explicitly incorporated its air quality standards, critical areas ordinances, and shoreline code and master plan into its SEPA substantive authority. These provisions highlight the importance of good air and water quality as well as fish and wildlife habitat. *See, e.g.,* CCC 19.30.010 ("The Board deems it to be in the best interests of the public to secure and maintain such levels of air quality as will protect human health and safety and to the greatest degree practicable, prevent injury to plant and animal life and property; foster the comfort and convenience of the county inhabitants; promote the economic and social development of the county and facilitate the enjoyment of the natural attractions of the county."); CCC 19.15.030(A)(4) ("Fish and wildlife habitat conservation areas perform many important physical and biological functions that benefit the county and its residents.").

The County has explicitly adopted authority to condition projects based on consistency with state and federal goals.[5] CCC 19.11.110 (B)(4)(h) ("In order to reduce or eliminate adverse environmental impacts, Cowlitz County may condition approvals on the applicant's compliance with particular state and/or federal statutes, regulations, agreements and/or permit conditions."). Among those policies so incorporated is the state's growing framework to reduce GHG emissions. *See, e.g.*, RCW 80.80.005(1)(a) (Washington is "especially vulnerable to climate change because of the state's dependence on snow pack for summer stream flows and because the expected rise in sea levels threatens our coastal communities."); RCW 70.235.070(1) (adopting standards that seek to reduce GHG to 1990 levels by 2020, and 50% below 1990 levels by 2050); RCW 80.80.040 (setting a GHG emissions standard for new power infrastructure); RCW 70.235.005(3) (state will "minimize the potential to export pollution, jobs and economic opportunities"); *see also* Governor's Executive Order 09-05 ("effective and immediate action to reduce greenhouse gas emissions . . . is essential to the future well-being of all Washingtonians"). Similar policies and goals have been adopted by the federal government, including the federal Clean Power Plan and the U.S. international commitments to dramatically reduce U.S. GHGs.

Even with the errors and oversights described in this comment letter, it is important to note that the DEIS itself finds many aspects of the MBT proposal would cause harm and risks to the environment and are both significant and unavoidable. Section S.7 summarizes the areas of impacts that cannot be mitigated. While we believe an accurate list of significant and unavoidable impacts would be both broader and deeper, this list alone provides a more than sufficient basis to deny this project under SEPA.

II. SEPA REQUIRES FULL DISCLOSURE OF ALL RISKS AND HARMS, AND ACCURATE, COMPLETE ANALYSIS

An EIS must evaluate the likely impacts related to the project. WAC 197-11-060(4). Decision makers must provide a "detailed statement" of environmental impacts. RCW 43.21C.030(2)(c). SEPA requires full disclosure and "detailed" consideration of all affected environmental values. At its heart, SEPA is an "environmental full disclosure law." *Norway*

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[5] The County has also adopted by reference all SEPA policies of the Department of Ecology. CCC 19.11.020.

Hill Preservation, 87 Wn.2d at 277. The *Norway Hill* court highlighted the legislature's intent that "environmental values be given full consideration in government decision making," and its decision to implement this policy through the procedural provisions of SEPA which "specify the nature and extent of the information that must be provided, and which require its consideration, before a decision is made." *Id.* at 277-78.

Environmental reviews under SEPA must identify significant impacts on the natural and built environment. WAC 197-11-440(6)(e). Such reviews must use sufficient information and disclose areas where information is speculative or unknown. WAC 197-11-080(1), (2). Where there is scientific uncertainty, Washington courts have required agencies to disclose responsible opposing views and resolve differences. These requirements feed into the ultimate standard of review for EISs, that, adequacy is based on a "rule of reason." *Cheney v. Mountlake Terrace,* 87 Wn.2d 338, 344 (1976). Courts require reasonably thorough information disclosure and discussion, good data and analysis to support conclusions, and sufficient information to make a reasoned decision. *Klickitat County Citizens Against Imported Waste v. Klickitat County,* 122 Wn.2d 619, 633 (1993). Sufficiency of the data under the "rule of reason" standard requires a "'reasonably thorough discussion of the significant aspects of the probable environmental consequences' of the agency's decision." *Weyerhaeuser v. Pierce Cnty.,* 124 Wn.2d 26, 38 (1994) (citations omitted).

In making the similar assessment under NEPA, federal courts require agencies to take a "hard look" at environmental impacts. More specifically, for review of the NEPA claims, the court must "ensure that an agency has taken the requisite hard look at the environmental consequences of its proposed action, carefully reviewing the record to ascertain whether the agency decision is founded on a reasoned evaluation of the relevant factors." *Te-Moak Tribe v. Interior*, 608 F.3d 592, 599 (9th Cir. 2010). This review must be "searching and careful." *Ocean Advocates v. U.S. Army Corps of Engineers*, 402 F.3d 846, 858 (9th Cir. 2005). It also is guided by a "rule of reason" that asks "whether an EIS contains a reasonably thorough discussion of the significant aspects of the probable environmental consequences." *Churchill County v. Norton*, 276 F.3d 1060, 1071 (9th Cir. 2001), *amended by*, 282 F.3d 1055 (9th Cir. 2002).

As discussed in the sections below, the DEIS fails to provide the necessary hard look and reasonably thorough discussion of environmental impacts in several important respects. These shortcomings will need to be rectified in the final EIS. As a preliminary matter, however, there are some significant procedural concerns with respect to this DEIS that undermine the process and weaken the public's role in ensuring a thorough analysis of all impacts.

The inadequate comment period undermines the quality and content of the DEIS and prevents the public from fully reviewing and responding to it. We understand that Cowlitz County and Ecology agree that a longer comment period should have been adopted but that the proponent refused to agree. We assume that its intransigence was a strategic effort to prevent thorough analysis. The Coalition has worked hard to do the best review it could in the time

available but additional time would have enabled us to make additional and more useful comments.[6]

Finally, we note one significant, overarching omission from the DEIS: the sordid history of this project and the proponent's dishonesty with regulators and the public. In 2010, the proponents sought permits from Cowlitz County to build a claimed 5 million ton/year project. After some Coalition members appealed that decision to the Shorelines Hearings Board, appellants uncovered confidential documents to expand dramatically as soon as permits were received. The attempt to defraud regulators led to national news and the withdrawal of this project. In our view, this event colors all of the claims that the proponents make about this project and its claimed benefits. It should not go unmentioned in this DEIS.

III. THE DEIS LEAVES SOME INDIRECT IMPACTS OUTSIDE ITS SCOPE

SEPA requires an environmental impact statement ("EIS") for any action that has a "probable significant, adverse environmental impact." RCW 43.21C.031(1). "Significance means a reasonable likelihood of more than a moderate adverse impact on environmental quality." WAC 197-11-794. "A proposal's effects include direct and indirect impacts caused by the proposal. Impacts include those effects resulting from growth caused by a proposal, as well as the likelihood that the present proposal will serve as precedent for future actions." WAC 197-11-060(4)(d). The scope of impacts includes direct, indirect, and cumulative impacts. WAC 197-11-792. "The range of impacts to be analyzed in an EIS (direct, indirect, and cumulative impacts, WAC 197-11-792) may be wider than the impacts for which mitigation measures are required of applicants." WAC 197-11-060(4)(e). It is implicit in SEPA that an "agency cannot close its eyes to the ultimate probable environmental consequences of its current action." *Cheney v. City of Mountlake Terrace*, 87 Wn.2d 338, 344 (1976).

Importantly, the regulations specifically direct that an "agency shall not limit its consideration of a proposal's impacts only to those aspects within its jurisdiction, including local or state boundaries." WAC 197-11-060(4)(b). Indeed, SEPA constitutes a ringing affirmation of the connectedness of Washington with the rest of the planet. It speaks of "humankind" and "human beings" rather than just citizens of this state. RCW 43.21C.010. SEPA explicitly calls on responsible agencies to "recognize the <u>world-wide</u> and long-range character of environmental problems" and take steps to cooperate in "anticipating and preventing a decline in the quality of the <u>world</u> environment." RCW 43.21C.030(f); *Eastlake Comm. Coun. v. Roanoke Assoc.*, 82 Wn.2d 475, 487 (1973) (observing "unusually vigorous statement of legislature purpose…to consider the <u>total</u> environmental and ecological factors <u>to their fullest</u> in deciding major matters") (emphasis added). Those regulations also recognize that environmental impacts do not end at the state's borders, and explicitly require consideration of the impacts of projects outside

[6] The problem was particularly pronounced with respect to GHG analysis and air modeling sections discussed below, in which we did not receive critical information until a short time before the close of the comment period. While we appreciate the Co-leads and consultant providing us with this information, it significantly hampered our ability to provide useful comments. We reserve the right to supplement this letter if necessary.

of the state's jurisdiction. WAC 197-11-060(c); *Cathcart-Maltby-Clearview Comm. Council v. Snohomish Cty*., 96 Wn.2d 201, 209 (1981) (SEPA "also mandates that extra-jurisdictional effects be addressed and mitigated, when possible.").

The Coalition has previously argued for a broad scope for this EIS to include all direct, indirect, and cumulative impacts, which includes rail transportation out of state, additional coal mining in the Powder River basin and elsewhere, and impacts on consumption of fossil fuels in jurisdictions that import coal from the terminal. Our concerns were shared by numerous federal and state agencies, local governments, Tribes and countless members of the public. We appreciate the Co-leads' efforts in including many of these impacts in the DEIS, as required by SEPA. However, we note that there are still serious environmental concerns that are proximately caused by this project that are not included in the DEIS but should be.

First, the DEIS acknowledges that an indirect effect of the terminal is increased rail traffic, and its attendant pollution, rail line congestion, and impacts on road traffic and emergency response. Ch. 5.1. However, the DEIS appears to assume that these impacts end at the state border. This makes little sense. **The extensive traffic congestion and system user impacts will be just as serious in Idaho, Oregon, Montana, and Wyoming**. For example, the DEIS acknowledges that capacity could be significantly constrained in those states. DEIS 5.1-14 (capacity as low as 30 trains a day in some locations, with existing traffic between 25 and 28 a day). These impacts should not be qualitatively dismissed, and indeed, WAC 197-11-060(4)(b) requires that they should be treated in the same manner as the in-state effects. While the Coalition understands that some limited qualitative information is given on out-of-state impacts, there is no reason to treat the out-of-state rail impacts differently. It does not even appear particularly challenging to provide the basic information on capacity deficits on individual rail segments, as is done for in-state rail. The Coalition asks that the FEIS include information on out-of-state impacts in the same manner.

Similarly, although the DEIS provides a discussion of accident risk in the Columbia River, we are puzzled by the DEIS's decision to limit the scope of that analysis to three miles offshore. Obviously, the marine transport vessels will continue to exist past that three-mile mark. Indeed, the DEIS does not appear to be consistent on this point, as it includes GHG impacts from vessel transport for the entire cross-ocean voyage. As discussed below, the DEIS also inappropriately ignores "upstream" impacts like induced mining demand.

We are also concerned that the issue of spill risk during bunkering is dismissed since the proponent promises not to bunker onsite. The promise simply begs the question of where will bunkering occur, as the vessels will not arrive from Asia fully fueled. If vessels will not be bunkering in the Columbia as claimed, that means necessarily that they will be bunkering in the Salish Sea, either on the way to or back from the facility. As other studies have revealed, **bunkering results in frequent spills of fuel into environmentally sensitive waters, and elevated risks of spills**. Transit of Panamax-sized bulk vessels into the Salish Sea for bunkering would also increase traffic in that area, which adds a risk of vessel incidents that is growing cumulatively with many additional new projects proposed in the region. We ask that these omissions be rectified in the FEIS.

IV. THE DEIS UNDERSTATES DIRECT AND INDIRECT GREENHOUSE GAS EMISSIONS

The Coalition applauds the Co-leads for including in the DEIS an analysis of the direct and indirect impacts of the project on GHG emissions, including the most important component of the project's impacts, its effect on the consumption of coal—the most polluting and dangerous of the fossil fuels. As the state, its communities, and the nation as a whole grapple with the dramatic changes that will be required in order to comply with our international commitments to reduce GHG pollution, there is probably no more critical issue in this DEIS than how to assess the question of this project's overall GHG impacts. While the DEIS makes a laudable start, there are some critical concerns and omissions that need to be dealt with in order to have a truly useful GHG analysis.

A. SEPA Standards for GHG Emissions Review

SEPA and its implementing regulations require consideration of direct and indirect climate impacts. *See* RCW 43.21C.030(f) (directing agencies to "recognize the world-wide and long-range character of environmental problems"); WAC 197-11-444 (listing "climate" among elements of the environment that must be considered in SEPA review). SEPA regulations also explicitly direct that environmental impacts outside the jurisdiction of the deciding agency should be considered. WAC 197-11-060(c). As discussed above, agencies are required to assess both the direct and indirect impacts of the proposal.

In 2008, a governor-appointed working group provided a list of recommendations on how to ensure that climate change is considered in meeting SEPA's directives.[7] Notably, those recommendations identified the following categories of GHG emissions to be considered pursuant to SEPA: a) off-site mining of materials purchased for the project; b) transportation of raw materials to the project, and transport of the final product offsite; and c) use of products sold by proponent to consumers or industry, including "emissions generated from combustion of fuels manufactured or distributed by the facility." *Id.* at App. D.

Ecology has issued SEPA Guidance for its own consideration of GHG emissions.[8] The Guidance makes clear that SEPA requires climate to be considered in its environmental analysis. Ecology's Guidance proposes that SEPA documents consider whether the proposal will significantly contribute to GHG concentrations, and states that "[i]f the emissions are proximately caused by the project, they should be disclosed regardless of their location." *Id.* at 4. The Guidance proposes that projects qualitatively disclose GHG emissions of at least 10,000 metric tons/year and quantitatively disclose GHG emissions for projects expected to produce an average of 25,000 tons/year of carbon dioxide equivalent.

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[7] *Available at* http://www.ecy.wa.gov/climatechange/docs/sepa/20110603_SEPA_GHGinternalguidance.pdf.
[8] *Available at* http://www.ecy.wa.gov/climatechange/sepa.htm.

Ecology has also provided a "table of tools" that can be used to calculate emissions from projects.[9] That Table, in turn, lists various sources of emissions from projects, methods to calculate those emissions, and options to mitigate them. Direct "Scope 1" emissions include trains and boats. *Id.* at 1. Scope 3 emissions include "emissions from the future combustion of fossil fuels," which are defined to include "emissions that will result from the combustion of fossil fuels transported, distributed or imported as a result of the project (e.g., natural gas pipeline)." *Id.* at 2.

A growing body of caselaw under SEPA's federal counterpart, NEPA, reveals that infrastructure projects like this one must consider both the upstream and downstream impacts of proposed actions.[10] Recent CEQ guidance makes that obligation explicit: an EIS should include "emissions from activities that have a reasonably close causal relationship to the Federal action, such as those that may occur as a predicate for agency action (often referred to as upstream emissions) and as a consequence of the agency action (often referred to as downstream emissions.").[11]

Many other tools are available to assist in how to disclose and assess the GHG footprint of major fossil fuel infrastructure investments like this one. A discussion brief from the Stockholm Environment Institute discusses three different approaches to analyzing these impacts.[12] One of them—simply disclosing the full impact of combusting the fuel that travels through the infrastructure—is discussed further below. Another framework, which the authors label the "political economics" approach, should receive greater attention in the FEIS:

> Finally, none of the approaches address what may be one of the most significant emissions impacts: how the development of further fossil infrastructure might further contribute to social or political norms, risk reduction, or economies of scale for fossil-based infrastructure that further contribute to its lock-in (or other fuels' or technologies' lock-out).
>
> For example, implementation of a major new fossil fuel infrastructure project (such as development of rail infrastructure to enable development of a coal deposit in Mongolia) may create local interests and political forces that lead to further, similar developments in the future (such as development of additional coal deposits). In contrast, decisions not to implement the same project could lead other alternative energy supply industries (e.g., solar

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[9] *Available at* http://www.ecy.wa.gov/climatechange/sepa.htm.
[10] Ex. 2.
[11] CEQ Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews, 79 Fed. Reg. 77,802, 77,826 (CEQ Dec. 24, 2014).
[12] Ex. 3.

> energy in the Gobi desert) to flourish and "lock in" or strengthen political momentum in the opposite direction.
>
> Focusing solely on marginal impacts of single investments can disguise larger, systemic changes and path dependencies. Therefore, in addition to those outlined above, a fourth perspective, that of a political economist, is important to consider as well, though it is less likely than the other three to yield a quantifiable result. This political economist might look at the political consequences of proceeding or not proceeding with a fossil fuel infrastructure project – and of the rationale for such a decision – and how climate policies or the investment actions of other major players might be influenced.[13]

The DEIS does little or nothing to disclose these kinds of potential impacts. For example, to what extent does authorizing the Longview coal terminal "lock in" additional coal reliance because it "uses up finite capital," "contributes to social or political norms for fossil fuels," "builds in redundancy of supply that helps to increase investor confidence in the long-term prospects" of coal, or "contributes to economies of scale for fossil fuel processing technologies"?[14] To what extent will providing a secure, low-cost source of PRB coal influence long-term investment decisions in Asia? While difficult to define quantitatively, these may well be the most significant and salient consequences of opening up the West Coast of the United States to exporting coal. However, they are not explored at all in the DEIS. This defect must be remedied.

B. <u>The DEIS Should More Fully Consider the GHG Implications of Combusting 44 Million Metric Tons of Coal/Year</u>[15]

A January 2015 study published in the journal *Nature* concluded that, to have a better-than-even chance of keeping warming below this critical threshold, the majority of the world's fossil fuel reserves that are still in the ground must stay there.[16] This includes, most importantly, coal. The study considered two scenarios: one assuming that carbon capture and sequestration ("CCS") technology will be unavailable and one assuming widespread deployment of CCS after 2025. Without CCS, 88% of coal reserves globally—and 95% of coal reserves in the United States—must remain unused before 2050 to meet the target of 2 °C. In light of this information, any action that involves the production and consumption of coal must be considered with the greatest of care.

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[13] *Id*.
[14] *Id*. at 2.
[15] As a threshold matter, the DEIS should disclose that the coal volumes discussed are in metric tons, or "tonnes": 44 million metric tons is equivalent to 48.5 million U.S. tons.
[16] Ex 4.

The Coalition agrees with the Co-leads that the DEIS must complete a full analysis of the lifecycle emissions of this project. And it agrees that the fundamental concepts—that export of large volumes of coal from the West Coast could alter energy consumption patterns and drive coal prices down, increasing coal consumption—are correctly stated. As discussed further below, the analysis included in the DEIS significantly understates these impacts. The indirect impacts of the project would be vastly higher than suggested, and would make the project one of the single largest GHG pollution sources in the nation.

However, buried in the middle of the DEIS with little emphasis is perhaps the single most significant number in the entire document: 90 million tons of CO^2/year, which is the combustion GHG impact of the 44 million metric tons of coal that would come through the facility. DEIS 5.8-22. **90 million tons of CO^2 roughly equals Washington State's entire GHG emissions from all sources.** While we agree that it may be appropriate to consider how these ultimate downstream emissions are reduced by displacement of other coal sources and the like, these market impacts are subject to a number of assumptions and unknowns that make accurate predictions challenging. While we have endeavored to provide the Co-leads with additional information to make these predictions as accurately as possible, it will be difficult to assess them with certainty.

Accordingly, we feel the appropriate approach is to start with the <u>certain</u> GHG emissions, which include the 90 million tons of CO^2 associated with 44 million metric tons of coal, and then offer some different scenarios which could theoretically offset that. This is an approach that has been taken in other EISs for fossil fuel transportation projects. For example, in the Tesoro-Savage DEIS, the full life-cycle emissions are provided and placed in context of the state's total emissions, while the potential reduction in that amount is provided in a more qualitative fashion.[17] While we have concerns about the overall GHG analysis in that DEIS as well, we think that the Co-leads should fully disclose the full life-cycle emissions of this project, in the context of Washington State's total emissions, before embarking on the more uncertain task of assessing international coal market responses. Indeed, the DEIS seems to minimize the impacts of the project by finding that the average net emissions constitute only 2.8% of the total potential emissions. DEIS 5.8-22. What it does not disclose is that the 90 million tons of CO^2 is certain—the 44 million metric tons of coal to be moved through that project will serve one and only one purpose, which is combustion in Asian power plants. The 97.2% reduction in that quantity proposed in the DEIS is based on a host of assumptions, speculations, and hopes. The Co-leads should be clearer with the public on the potential impacts.

C. <u>Indirect GHG Emissions Due to Changes in Coal Consumption Are Significantly Understated</u>

The DEIS includes a market analysis of how exporting coal to Asia will influence demand, and hence consumption, of coal in both the U.S. and Asia. This analysis, which is required by SEPA, directly refutes the longstanding industry claim that exported coal will simply substitute for other sources of coal with no impact on total amount consumed. The fundamental

[17] Ex 5 at 5-47.

principles of the market analysis—that exporting large volumes of U.S. coal will have an effect on supply, demand, price, and consumption— appear to be sound. That said, we believe that the analysis significantly underestimates the total amount of GHGs that will result from this project.

The Coalition has commissioned an expert review of the market analysis contained in the DEIS and technical report by Dr. Tom Powers et al., which is attached.[18] We incorporate that analysis into these comments. Dr. Powers explains several fundamental problems with the GHG analysis related to coal markets and combustion that, collectively, greatly understate the total GHG impact of this project. **As Dr. Powers explains, the market impact of exporting 44 million metric tons of coal a year is far greater than revealed in the DEIS.** As Dr. Powers shows, the true GHG impact of this project is totally unacceptable and an independent basis for denial.

The DEIS and market analysis shortcomings include the following:

- The analysis mistakenly assumes that the project is economic under most scenarios, but it is not. The only scenario under which the project could even conceivably be built is the mis-named "Upper Bound" scenario, which should be the preferred choice for drawing conclusions. Any scenario in which delivered coal prices from the proposed port are not competitive so that the project is not viable should be eliminated from the analysis, and a new "true" upper bound scenario should be developed.

- The DEIS mistakenly assumes that increasing production of coal in the PRB to meet export demand will increase domestic prices and hence lead to fuel switching to less-GHG intensive fuels, thereby offsetting a significant portion of the increased GHG caused by additional combustion in Asia. While this relationship between price and consumption is generally accurate, the DEIS is incorrect that production increases at the scale involved here would result in price increases for coal. To the contrary, there is abundant capacity of PRB coal (the production of which has been in decline for years) to increase production without any effect on price. Accordingly, the offsets described in the DEIS are illusory.

- The analytical model treats Asian and U.S. responses to changes in coal prices asymmetrically, in a way that understates potential increases in GHGs. In the analysis of market adjustments in the U.S., changes in consumption are only assumed to take place due to shifting from coal to gas and other lower-carbon sources. It does not include any potential reductions in total energy consumption associated with higher prices. In Asia, the problem is reversed: the only impact that is considered is reduced total energy consumption, not any switching to lower carbon energy sources. But the lower prices in Asia that would result from this project would not just increase total demand for electricity, they would also result in switching from lower-GHG fuels to coal. Indeed,

[18] Ex. 6, *Comments on the Greenhouse Gas Impacts and the Modeling of Coal Flows in the Millenium Bulk Terminals Longview SEPA Draft Environmental Impact Statement*, Thomas Michael Power, et al. (June 10, 2016).

the nations that the project purports to export to (including Japan, South Korea, and Taiwan) all have the capacity to shift from coal to natural gas. Similarly, China is in the process of converting to a greater share of natural gas: availability of cheap coal could encourage them to temper that shift. The failure of the model to include this understates the potential for increased GHG emissions.

- The proprietary IPM model used as the basis for the analysis is a closed "black box" model that makes it all but impossible for the public and decisionmakers to replicate. While the Coalition appreciates the Co-leads' efforts to provide our consultants with additional information, it doesn't solve the fundamental problem. Moreover, the information was provided just a short time before the close of the comment period. The Co-leads should not rely on this tool without requiring disclosure of all data, assumptions, and inputs. Alternatively, the Co-leads should re-run the analysis using the open-source NEMS model, which would provide the public with the ability to scrutinize the inputs and assumptions, and to provide much more useful comment.

D. Failure to Utilize Social Cost of Carbon

While the DEIS seeks to calculate the quantity of GHGs associated with this project, it makes little or no effort to discuss the implications of additional GHG pollution. At one time, such an oversight was understandable, because there were few useful tools available to do so. That is no longer the case. The social cost of carbon is a tool for assessing the costs of carbon pollution that was created by an interagency working group in 2010 consisting of scientific and economic experts from a dozen federal agencies and offices, including EPA and the Departments of Agriculture, Commerce, Energy, Transportation, and the Treasury.[19] The working group's primary goal was to help federal agencies engaged in rulemaking to quantify the economic benefit of federal actions that reduce CO^2 emissions. The result of their efforts was the social cost of carbon – a schedule of estimates of the global economic harm caused by each ton of emissions in a given year, expressed as $/ton.[20] These values encompass damages from decreased agricultural productivity as a result of drought, human health effects, and property damage from increased flooding, among other factors.[21]

In a recent case arising under NEPA, a U.S. District Court rejected an EIS for a coal mine because it failed to incorporate the social cost of carbon into its GHG analysis. The court rejected older cases that upheld agency action without calculation of the economic impacts of GHG pollution because no tool existed at the time of those cases:

> I am not persuaded by these cases, or by anything in the record, that it is reasonable completely to ignore a tool in which an

[19] Interagency Working Group on Social Cost of Carbon, Technical Support Document: Social Cost of Carbon 2-3 (Feb. 10, 2010), attached as Ex. 7.
[20] Fact Sheet: Social Cost of Carbon, ENVTL. PROT. AGENCY (Nov. 2013), attached as Ex. 8.
[21] Interagency Working Group, Technical Update of the Social Cost of Carbon 2 (May 2013), attached as Ex. 9.

> interagency group of experts invested time and expertise. Common sense tells me that quantifying the effect of greenhouse gases in dollar terms is difficult at best. The critical importance of the subject, however, tells me that a "hard look" has to include a "hard look" at whether this tool, however imprecise it might be, would contribute to a more informed assessment of the impacts than if it were simply ignored.[22]

Scientific reviews have concluded that the interagency social cost of carbon estimates do not account for, or poorly quantifies, certain impacts, suggesting that the estimated values are conservative and should be viewed as a lower bound. For example, one study identified that damages such as "increases in forced migration, social and political conflict, and violence; weather variability and extreme weather events; and declining growth rates" are either missing or poorly quantified in SCC models.[23] Another concluded that the 2010 Interagency social cost of carbon "omits many of the biggest risks associated with climate change, and downplays the impact of current emissions on future generations," and suggested that the social cost of carbon should be almost $900 per ton of carbon.[24] Virtually all commentators have concluded that the current federal guidance understates the true cost of GHG pollution, and any use of the tool should disclose as much.

While acknowledging these factors, the FEIS should calculate the range of potential economic costs of the project's potential GHG emissions using the social cost of carbon. EPA guidance has calculated a range of potential per-ton costs of between $13 and $137, depending on the discount rate used, while also acknowledging that the IPCC has found that it is "very likely" that SCC underestimates the economic damages. **Even so, application of these figures to the GHG estimates associated with exporting 44 million metric tons/year of coal reveals the staggering costs associated with this project—even at the low end, the costs are many hundreds of millions of dollars per year, while at the high end, costs are in the multiple billions.** While an imperfect tool (mostly because it underestimates costs), it would help the public grasp just how grave the impacts of this project are. We ask that the FEIS include a cost analysis using the social cost of carbon method.

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[22] *High Country Conserv. Advocates v. U.S. Forest Serv*., 52 F. Supp.3d 1174, 1194 (D. Colo. 2014).
[23] *See, e.g.,* Peter Howard, et al., Environmental Defense Fund, Institute For Policy Integrity, Natural Resources Defense Council, OMITTED DAMAGES: WHAT'S MISSING FROM THE SOCIAL COST OF CARBON, (March 13, 2014), attached as Ex. 10.
[24] Frank Ackerman & Elizabeth A. Stanton, CLIMATE RISKS AND CARBON PRICES: REVISING THE SOCIAL COST OF CARBON (2012), attached as Ex. 11.

E. GHG Emissions from Fossil Fuel Transportation Are Understated

Overall, it appears that the DEIS does a credible job of calculating GHGs from transportation of fossil fuels.[25] The study reveals that even if the issue of combustion is taken off the table, the project would be one of the state's largest emitters of GHGs. However, there are some shortcomings that should be addressed in the FEIS.

First, the DEIS models marine vessels traveling from the U.S. to Asia, not return trips. The authors assume return trips would be laden with other goods and should therefore not be counted in this analysis. However, the DEIS fails to support this assumption, and there is ample evidence to support the opposite conclusion. While the Millennium DEIS describes the potential for the U.S. to import up to 800,000 tons of pet coke and coal tar pitch from Asia, that's less than two percent of the 44 million metric tons being sent west across the Pacific. In fact, among the major dry bulk commodities, like grains, coal, and iron ore, the U.S. exports far more than it imports from China.[26] Moreover, there is currently a surplus of dry bulk carriers overall and a concentration of those carriers bringing commodities to China – facts that imply competition is fierce for carrying dry bulk cargo outbound from China.[27]

It is therefore likely that some, if not the majority of, international vessels servicing Millennium (80% Panamax and 20% Handymax)would be returning from Asia with ballast water, not cargo as the report assumes. Globally, ballast water voyages for dry bulk carriers are common. A typical Panamax dry bulk vessel takes around eight voyages with cargo and five with only ballast water each year. Handymax vessels average nine cargo-laden voyages and five only-ballast legs. For coal voyages, the numbers may be even worse: a sailing pattern from Australia to Japan/Korea/China with coal is estimated at six voyages per year with cargo and five (the return trips) with only ballast.[28] With international vessel emissions making up the largest share of emissions in some scenarios, including the return trip would be a significant contributor to the project's greenhouse gas. Accordingly, the GHG calculations should be revised to include both legs of the sea voyage, which would significantly increase the project's GHG footprint.[29]

Second, we think that the offsetting of vessel transportation emissions based on various market scenarios is needlessly complicated and speculative. The terminal will be the proximate cause of vessel transport to and from Asia, and the GHGs associated with that transport are readily calculated and should be clearly disclosed. Speculative offsets from other changes in transportation can be addressed in a qualitative way.

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[25] However, the DEIS's approach of calculating emissions based on location—e.g., Cowlitz County, the remainder of the state, and elsewhere—is confusing and disjointed. The FEIS should categorize emissions by category—e.g., all transportation, all operations, and coal combustion.
[26] Ex. 12.
[27] Ex. 13.
[28] Ex. 14 ("[T]hese vessels will in average do six voyages a year with cargo and five in ballast due to imbalances in trade.").
[29] Moreover, even if they were carrying something back, the Longview terminal would surely not be its destination—so additional distances would be required to return to the terminal itself.

Finally, the technical report only calculates emissions associated with increased vehicle waiting times within the immediate project area, ignoring the extensive delays throughout the state and beyond. The FEIS should extrapolate these valuates to the entire project.

Adding all these changes together, and disclosing them in a coherent way, would reveal that the GHG impact of the project is startlingly high, even before assessing any combustion of coal or changes to coal markets. This should not necessarily come as a surprise: transporting 44 million metric tons of minerals halfway around the globe would require a significant amount of fossil fuel energy. The high GHG footprint of the project's transportation emissions highlights the absurdity of this project and the stark choice for the Co-leads.

F. The DEIS Should Include the GHGs of Coal Extraction

The technical analysis for GHGs properly includes transportation to and operations at the terminal, as well as some of the impacts of coal combustion. However, it does not include the GHGs of extraction of coal. This is not explained, nor does it meet the standards listed above.

In contrast to "downstream" combustion of coal, increased coal mining is considered an "upstream" impact of the coal terminal decision.[30] As noted above, CEQ guidance requires consideration of actions which "may occur as a predicate" to the agency decision under review.[31] Recently, EPA commented on proposed NEPA guidance issued by FERC, specifically observing that FERC should consider increased gas production as an indirect effect of its gas pipeline decisions.[32] In listing potential sources of GHGs to be considered under SEPA, Ecology's table of tools specifically mentions "Emissions produced in the mining, harvest, processing, and transportation of materials that will be used as feedstocks by the project when operational."[33]

GHG emissions from coal extraction are no small matter. In addition to the significant energy required to move colossal quantities of earth and minerals to mine and prepare coal for transport, it is increasingly well understood that coal mining in the PRB releases significant quantities of methane, a potent GHG.[34]

It is difficult to see how the extraction of coal for the terminal should be treated any differently than the transportation of that coal to the terminal site. Both are proximately caused by the terminal—the 44 million metric tons of coal that would be shipped out of the terminal would not be mined but for the terminal, as it would be supplementary to any coal mined for other purposes. As discussed in the Powers report, there is abundant supply of coal in the Powder River basin, supply that would remain in the ground if it were not for this project. GHGs should be calculated for this component of the project and included in the final estimates. We

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[30] *See* Burger and Wentz, *supra*.
[31] CEQ Guidance, *supra*, 79 Fed. Reg. at 77826.
[32] Ex. 15.
[33] Ecology guidance, s*upra*, at 2.
[34] Ex. 16.

discussed this issue extensively in our scoping comments and are surprised to see the exclusion of extraction from the GHG analysis. *See* Scoping Comments, at 37.

The GHG technical report states that extraction is excluded because it has already been addressed in "separate GHG analyses" required by NEPA for the coal mines. Technical Report at 2-5. No specific NEPA analyses are identified. In fact, the statement is in many cases incorrect. Historically, BLM did not include GHG estimates from extraction (or anything else) in its coal lease EISs, which can be as old as 20 years.[35] Moreover, while recent agency and court decisions have suggested a more thorough approach to GHG emissions for new mines in the future, there remains over 20 years' worth of already-leased coal available. Supply for this terminal can be provided for years before new mines need to be developed. Moreover, there is no reason in either the governing regulations or applicable precedent that states that an impact can be ignored just because it is addressed in another EIS. At issue here is not a GHG "reporting" regimen in which it is critical that a given set of emissions not be counted more than once. Rather, the issue here is an understanding of the results that are caused by this decision, and a given set of effects can have more than one cause. **Simply put, exporting 44 tons of coal means mining 44 more tons of coal than would otherwise be the case**. It should be included in the FEIS.

G. <u>The GHG Analysis Only Assumes Full Operations for 11 Years</u>

The GHG analysis includes estimates for GHG emissions on an annual basis, and as "total." However, the analysis is based on a highly unrealistic set of assumptions that understates the true total GHG impact of this project. Specifically, the analysis looks at a time scale of 2018 to 2038, with full operations not occurring (due to a multi-year ramp-up) until 2028. Technical Report at 2-13. **In other words, the analysis only assumes that this project will be operating at full capacity for 11 years.** This assumption is highly unrealistic—no company would invest $700 million for an infrastructure project with that short a lifetime. A typical lifetime for such a project is closer to 50 years. Annual emissions provide a more than adequate basis to consider and compare the emissions of this project, and "total" emissions should be based either on an expected lifetime of 50 years, or omitted altogether.

H. <u>The Proposed Mitigation Is Inadequate</u>

Correction of the flaws included in the DEIS would reveal that GHG pollution from this project is far more significant than admitted. But however it is counted, the project will be a major source of GHG pollution. And given the state's repeatedly stated interest in reducing its GHG emissions, 100% of its emissions should be mitigated. That is why we are puzzled that the DEIS only proposes to mitigate half of the GHG emissions that are estimated. **If Washington is serious about its commitment to reducing GHGs, then the project must either be denied or 100% mitigation required.** If the project proponent does not wish to go forward under such a requirement, that is its own decision.

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[35] Ex. 17.

Acceptable mitigation options must include both denial of the project outright, as well as a requirement to purchase credits from a legitimate and verified source to offset all net GHG emissions on an annual basis, including lifecycle emissions that are proximately caused by the project. Alternatively, the state could impose a GHG fee and use it to implement offsets of its own. But the state is no longer in the position of being able to allow major new sources of GHGs without 100% mitigation.

V. THE DEIS UNDERSTATES THE IMPACTS ASSOCIATED WITH RAIL TRANSPORTATION OF COAL

The DEIS highlights the significant concerns associated with massive increases of rail transportation that would be caused by this project. Sixteen additional trains, a mile and a third long each, would traverse major portions of the state each day. **This increase would explode the capacity of the rail lines, cause major traffic concerns in Northwest communities, and exacerbate coal dust and diesel pollution in both urban and environmentally sensitive areas.** Regrettably, the DEIS does not do a complete or even adequate job of disclosing these concerns. In some cases they are openly dismissed without foundation. Even so, the DEIS concedes a number of significant and unavoidable impacts that would by themselves warrant denial.

One major flaw infects all of the DEIS analyses related to rail. Buried in the DEIS is the surprising assumption that a 10% increase in "throughput" can be achieved from rail car capacity by 2028. DEIS at 5.1-4. It is not stated how 10% more coal will fit in the same size rail cars, nor is it at all self-evident. The assumption is totally unwarranted. If anything, it is likely that any additional future coal dust suppression mechanisms, like load profiling or a requirement for covered rail cars, would <u>reduce</u> the amount of coal that could be transported per car. In other words, as currently stated, the rail analysis from the outset underestimates by at least 10% all of the potential impacts. Delays, accidents, and pollution would all be 10% higher than disclosed in the DEIS. This will need to be corrected in the FEIS.

Another critical flaw that merits serious attention is the failure of the DEIS to place the rail-related impacts in the context of the Columbia River Gorge National Scenic Area. As explained in the separate comments of Friends of the Columbia River Gorge, the National Scenic Area is a national treasure. While the rail-related impacts of this project would be unacceptable virtually anywhere, they are even more egregious in light of the special resource values, economic values, and national interests in preserving and protecting this special place. We ask that you devote a separate chapter to the National Scenic Area and which of its values would be compromised by approval of this project.

Finally, we note that the DEIS concedes that rail operations would significantly interfere with tribal fishing access. Indeed, for the reasons discussed below, the impacts to tribal fishing are likely far greater than disclosed in the DEIS. Our organizations support the Tribes and object to any project that causes significant impacts to tribal fishing. Unless mitigation can be worked out in cooperation with the Tribes, these impacts provide an independent basis for project denial.

A. The DEIS Must Disclose and Consider the Impacts of Rail Infrastructure Upgrades

The DEIS openly acknowledges that infrastructure on the BNSF Spur and Reynolds Lead is effectively incapable of handling the proposed increase in rail traffic due to capacity constraints. *See, e.g.,* DEIS 5.16-16; 5.1-10 (maximum existing capacity of BNSF Spur and Reynolds Lead is 16 trains/day, and there is already traffic on it). Similarly, other components of the rail system cannot function with this project in place without significant upgrades. However, it further observes that there is a proposal to upgrade that infrastructure to accommodate the traffic, although that project is neither "funded or permitted." DEIS 5.1-16. This appears to be a troubling effort by the proponent to unlawfully segment a single project into multiple components for environmental review.

Under SEPA regulations, agencies must consider "[p]roposals or parts of proposals that are related to each other closely enough to be, in effect, a single course of action" together in a single EIS. *See Gebbers v. Okanogan County Pub. Util. Dist. No. 1*, 144 Wash. App. 371, 380 (Wash. Ct. App. 2008). As stated in the regulations:

> (b) . . . Proposals or parts of proposals are closely related, and they shall be discussed in the same environmental document, if they: (i) Cannot or will not proceed unless the other proposals (or parts of proposals) are implemented simultaneously with them; or (ii) Are interdependent parts of a larger proposal and depend on the larger proposal as their justification or for their implementation.

Wash. Admin. Code 197-11-060. Conversely, courts have stated that an EIS need not include an analysis of arguably connected actions if the additional projects "are either substantially independent from the proposed action or are not necessary to meet the project's purpose and need." *Gebbers*, 144 Wash. App. at 380-81; *see also SEAPC v. Cammack II Orchards,* 49 Wash. App. 609 (1987) (EIS need not cover subsequent phases if initial project is substantially independent of subsequent phase and project would be constructed without regard to future development).

Future expansion work on the BNSF Spur and Reynolds Lead does not meet this standard. According to the DEIS, operating the project without those improvements will have significant and unacceptable impacts, and may not even be feasible at all. DEIS 5.1-16. And without the coal terminal, there is no identifiable need to do the upgrades. *Id*. 5.1-17 (LVSW would not undertake the work without assurance that future traffic will be available). Washington Department of Natural Resources highlighted this concern in its scoping comments, observing that the existing rail system is located immediately adjacent to the shoreline for long stretches and hence any upgrade work would have significant potential impacts.[36] While the DEIS discusses the potential benefits of this work (e.g., shorter travel times and reduce traffic), it is silent on the environmental consequences, risks, and downsides, to say nothing of alternatives.

[36] *See* DNR Scoping Comments, Nov. 18, 2013, at 12.

This kind of one-sided balancing is not appropriate. Accordingly, the rail upgrades and the terminal are connected and the project should be revised to include this very significant work, along with a revised DEIS that puts it in the appropriate context.[37]

B. Coal Dust From Rail Cars is a Major Concern

Among the more surprising conclusions in the DEIS is the dismissal of all health and environmental concerns associated with rail-related coal dust pollution, ultimately finding that coal dust pollution from rail is not a significant concern. This section of the DEIS is deeply flawed and needs substantial revision.[38] It is largely borrowed from another, totally inadequate and incomplete draft EIS (for the Tongue River railroad). It is completely inconsistent with extensive data from other places, and years of observations of rail traffic. **The truth is that coal dust pollution is a major problem – for the railroads, for the environment, and for people who live near the tracks.** This section of the DEIS should be overhauled completely.

A preliminary and significant flaw is that the DEIS uncritically accepts industry statements that surfactants are 85% effective at reducing coal dust, and that there is 100% compliance with using surfactants. Those assumptions should be challenged for several reasons. First, it is inconsistent with real-world experience. The Coalition incorporates by reference the separate comments and exhibits submitted by Friends of the Columbia Gorge describing ongoing coal dust pollution in the Columbia Gorge from existing rail traffic. This information shows that airborne deposition of coal dust remains a significant problem, even since the construction of a second surfactant spray facility in Pasco, and that the railroad is undertaking efforts to clean up coal dust adjacent to the Columbia River even as it denies that dust is a problem.

Second, the industry has not provided adequate data to back up its 85% claim; these statements about effectiveness have not been independently peer reviewed or assessed. Do they account for the high wind conditions in the Gorge, for example? Third, there is evidence that coal shippers are ignoring the surfactant tariff and not applying a surfactant at all. A utility coalition estimated only 30% of coal shippers were applying a surfactant.[39] And finally, the claims of effectiveness are belied by the evident need to build and operate a second spray station in Pasco. Plainly, if the surfactants remained effective for their entire voyage, respray would not be necessary. But there was abundant evidence that the surfactant wears off, prompting BNSF to

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[37] The same would be true under federal law as well. An action that "cannot or will not proceed unless other actions are taken previously or simultaneously" and actions that are "interdependent parts of a larger action and depend on the larger action for their justification" must be considered together in a single EIS. 40 C.F.R. § 1508.25(a)(1). Where one action involves the development of infrastructure necessary to proceed with another action, it must be considered in a single EIS. *Thomas v. Peterson*, 753 F.3d 754, 759 (9th Cir. 1985). Plainly, the project cannot proceed without massive infrastructure development on the rail lines; conversely, such infrastructure development will not be necessary without the project. Under federal law they would have to be considered together in a single EIS.

[38] This comment letter addresses the health impacts of coal dust, and the coal dust pollution at the terminal site, below in separate sections. This section addresses coal dust impacts associated with rail transportation.

[39] Ex. 18.

invest in the Pasco facility. By definition, the surfactant is not 85% effective right before the respray station, nor is it appropriate to assume that it will be 85% effective a few hundred miles later when arriving in Longview. But the DEIS incorrectly assumes that the surfactant is 85% effective over the entire voyage.

Indeed, the DEIS itself acknowledges that so much dust is produced by coal trains that it creates a safety hazard by destabilizing railroad ballast. DEIS 5.7-15. The point is well taken, as coal dust accumulation in railroad ballast has been documented as a factor in derailments, and BNSF has undertaken significant efforts to remove coal dust in the Columbia and elsewhere. However, the DEIS does not acknowledge the huge inconsistency between its modeled conclusions of "insignificant" dust deposition with the known experience that so much coal dust is escaping that it is destabilizing rail infrastructure. Both of those things cannot be simultaneously true.

Another data point reflecting that the DEIS model-based approach is inconsistent with known experience is hidden in the technical report itself. Figure 4 of the coal dust technical report compares the "modeled" emissions of coal dust with the actual emissions as measured during the October 2014 test. As Dr. Dan Jaffe has pointed out in his independent comments, **actual emissions are four times higher than the modeled emissions**. Even so, the DEIS conclusions are all based on the modeled emissions, likely understating the dust impacts by a considerable degree. The Coalition incorporates by reference Dr. Jaffe's comments, which address this as well as a number of modeling flaws.[40] This is true even though the measured emissions that form the basis for the DEIS conclusions are themselves deeply compromised, as discussed in both Dr. Jaffe's analysis as well as the separate comments submitted by Friends of the Columbia Gorge.

Recent data from Australia backs up our concern that "real world" measurements do a substantially better job predicting what will happen than the models used in the DEIS. In a recent study in Australia, monitors showed dramatic spikes—including spikes that exceed levels set to protect human health and safety—when uncovered coal cars passed by.[41] **One particularly startling finding of this study was that empty coal trains had higher particular pollution than loaded ones**. However, the DEIS dismisses pollution concerns from empty cars, an omission that must be rectified in the FEIS.

A critical question remains unanswered with respect to the ecological impacts of coal dust in water and the environment. Relatively little is known about the how coal dust harms plants and animals in the aquatic environment. However, a recent study in Nature confirmed a link between coal dust and mortality to aquatic organisms.[42] Although the DEIS acknowledges that the USGS is currently studying the issue closely, it doesn't acknowledge the possibility that

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[40] Although the DEIS lists Dr. Jaffe's previous work on the question of coal dust pollution from trains, we are puzzled that it nowhere references that work, which reaches very different conclusions from those presented in the DEIS.
[41] Ex. 19.
[42] Ex. 20.

there may be serious impacts to the Columbia River associated with coal dust. There is certainly no scientific basis on which to conclude that it is not a problem, given the paucity of scientific studies on the topic. The Coalition understands that the USGS work is almost complete. Given the critical importance of this question, we ask that the FEIS not be released until the USGS results are finalized and incorporated into this section.

The DEIS relies heavily on one field study conducted over two weeks in October 2014 that found relatively small amounts of coal dust pollution and deposition, lower than a similar peer reviewed study conducted by Dr. Jaffe. DEIS 5.7-7. However, little information is provided on variable background conditions (such as wind speed and other weather factors) that could affect the outcome, or other factors (such as whether the railroad was aware of the time and location of the study). Nor is acknowledgment made of other credible and peer reviewed studies that found much different results, like Dr. Jaffe's work, or of the verifiable "real world" experience with significant pollution in some conditions in the Columbia. This one study should not receive any particular weight given its inconsistency with others.

The DEIS also relies heavily on coal dust analysis prepared by the Surface Transportation Board for the now defunct Tongue River Railroad EIS process.[43] That EIS process used the same flawed model approach that is used in this one. It was the subject of intense criticism and expert review which found that actual emissions would be far higher than predicted. The Coalition incorporates by reference the environmental group comments on the TRR DEIS, and accompanying expert report prepared for the Northern Cheyenne Tribe.[44] These criticisms are equally appropriate in the context of this DEIS.

The DEIS is also totally silent on the other mechanism by which coal dust can enter the environment: via leaking from the bottom of the open rail cars due to precipitation events or even just normal travel. The open rail cars are not watertight: if the train encounters rain or snow during the lengthy voyage to Longview, that water—presumably carrying some amount of coal dust and particles—will leak out the bottom of the train. It is also possible, since the cars are not airtight, that coal dust leaks from the bottom during normal rail travel conditions. The Coalition is unaware of any modeling to estimate how much coal is introduced into the environment in this manner, and asks that it be modeled in the final EIS.

Overall, the issue of coal dust is deemed insignificant because known pollution would be below federal health standards. DEIS 5.7-25. That is not the only basis on which to deem an impact significant. As documented above, the conclusions are likely greatly understated and there remain too many unknowns to dismiss coal dust pollution. The DEIS acknowledges that coal dust deposition on property for people who live near the rail lines would be a "nuisance."

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[43] Before Arch Coal abandoned its stake in this project, it also abandoned its stake in a rail line in Montana known as the Tongue River Railroad. The EIS process is not progressing, so there will never be a response to the multiple critiques made by groups on the DEIS. *See, e.g.,* Arch Exits Terminal ownership as critics get more vocal, Greenwire, May 27, 2016, *available at* http://www.eenews.net/greenwire/2016/05/27/stories/1060038044.

[44] Exs. 21 and 22.

People who live near existing coal terminals experience this "nuisance" in the real world, and presumably find the impacts "significant." For example, one newspaper story about a community near the Westshore coal terminal documented the constant problem of coal dust at the local marina:

> At the Point Roberts Marina, nearly 1,000 pleasure boats are docked with access to the Strait of Georgia. Coal dust is a "constant problem" for boat owners, who are frustrated to find their white boats covered with gray soot, said Jacquelyne Everett, the marina manager.[45]

Finally, the mitigation proposed for the coal dust issue is totally unsatisfactory. The only mitigation for coal particulate pollution—which is a health hazard, an environmental issue, and a nuisance to property owners—is to eliminate the pollution. The proponent has no inherent right to discharge any of this pollution, and should be held to a strict standard to mitigate environmental impacts. Accordingly, the Co-leads should analyze the effectiveness of full rail car covers, which are increasingly in use in Australia and other locations.[46] Covered rail cars are used in many bulk commodities. They should be mandatory here, too.

C. Unexamined Impacts on Other Rail System Users

The Washington State Department of Transportation Freight Rail Plan 2010-2030 (attached to the Coalition's scoping comments at Ex. 164) indicates that a number of critical sections of track, including the Columbia Gorge, were at or near capacity in 2008 and predicted further congestion by 2028. Other key chokepoints are identified in the Washington State Transportation Commission's Statewide Rail Capacity and System Needs Study, December 2006 (Scoping Comments Ex. 162), and the *Heavy Traffic Ahead* study (Scoping Comments Ex. 148). [47] Additional critical bottlenecks include the Columbia Gorge and the Spokane-Sandpoint Corridor (known in railroad parlance as "the Funnel" due to the fact that most major east-west rail corridors converge there). This project would clearly contribute to additional congestion in these areas. However, the DEIS masks the true extent of these impacts.

Specifically, there is abundant evidence that rail congestion is causing economic harm to other users of the system, as fossil fuel freights—which are more profitable for the rail lines—displace agricultural products and other traffic. However, this impact is not evident in the DEIS. The FEIS should fully analyze the impacts on Northwest shippers if inbound and outbound freight traffic is diverted or eliminated due to the competition with coal trains. Unless mitigated with significant capacity additions, the additional increase of coal train traffic is likely to present significant adverse impacts on other users of the rail line, including grain and fruit shippers,

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[45] http://tdn.com/news/local/westshore-provides-glimpse-of-longview-s-potential-future-with-coal/article_35ad9c0c-3634-11e0-8eea-001cc4c03286.html
[46] http://www.ecofab.com/
[47] To the extent necessary, all of our previous scoping exhibits are incorporated by reference into this DEIS comment.

intermodal users, ports, industries, aircraft manufacturers and passenger rail—all of whom are critically dependent on timely and affordable access to the rail system. This issue is particularly consequential in the context of cumulative effects. Even so, this terminal has such a significant impact—16-mile-plus-long trains each day in many parts of the state and region—that even on its own there is an identifiable impact.

Coal and oil traffic are already displacing and harming other economic sectors. Rail costs are a significant factor affecting the lack of competitive status of Washington ports as compared to others on the West Coast due to the prioritization of higher freight rates paid by fossil fuel shippers. In March 2015, the Washington Department of Ecology released the *Marine and Rail Oil Transport Study-Preliminary Findings & Recommendations*.[48] Although the focus of the report is on crude oil, its findings are equally applicable to the overabundance of coal trains on the regional rail system:

> The addition of crude by rail trains is causing concerns about slowdowns or temporary blockages of other freight trains carrying grains and other perishable food commodities. This is mainly due to a lack of locomotives, freight cars, and other factors, in addition to congestion on the rails. BNSF and UP have stated that the increase in crude by rail trains will not impact other freight train traffic, however, some stakeholders are concerned. Decisions on the use of locomotives and railroad lines are based on commercial market factors. The issue of train capacity affecting transportation of various commodities is not a new one. At some times of year, anhydrous ammonia shipments (for fertilizer used in spring planting) are given priority, for example.

Id. at 41. News outlets from *The New York Times* to *Bloomberg News* report on the significant toll of fossil fuel rail traffic on other commodities and port business.

Similarly, the DEIS fails to analyze impacts, mitigation measures, and potential funding relating to the use of passenger rail on these same lines. The Amtrak Cascades Mid-Range Plan discusses how Washington and passenger rail advocates have significant plans for increases of passenger rail capacity, including adding additional high-speed passenger trains on the I-5 corridor.[49] The DEIS must analyze how existing and expanded passenger rail uses will be impacted if freight traffic increases.[50] The DEIS should also consider existing and prospective public funding for rail capacity to purchase passenger rail service. The public has spent billions of dollars on rail improvements to ensure that passenger rail fits with existing capacity, and it is

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[48] Ex. 23.
[49] Ex 24.
[50] Passenger service that may be affected would include, among others, Sound Transit Sounder Commuter services as well as Amtrak intercity service and Empire Builder service between Seattle and Chicago. The Empire Builder service also utilizes "The Funnel" in Spokane, which is expected to see the greatest increase in freight rail traffic because of the coal shipments.

imperative that the DEIS fully analyzes the past and prospective investments to ensure that public funds are not spent for private purposes.

The DEIS must also account for the demand for public investment spurred by this project. Rail infrastructure improvements are anticipated, although it is far from clear how those improvements will be funded. Rail lines and infrastructure will also need to be regularly maintained, and there will be mitigation costs for structures such as overpasses, tunnels, and railroad crossings. The DEIS must also address whether the public will be expected to bear any costs for infrastructure constructed for private benefits. Federal and state governments commonly bear a significant share of the costs of freight rail capacity improvement projects.[51] The DEIS should include all needed capacity improvements that will be required to address at least those areas where the planned oil train traffic will exceed the capacity of the existing system.

D. Increased Rail Traffic at Crossings Weakens Emergency Response and Increases the Risk of Accidents

The DEIS acknowledges that there will be significant traffic delays associated with this proposal.[52] However, it is surprisingly dismissive of the risk that increased rail traffic will cause real harm to emergency services and responses. Frequent long trains at rail crossings will mean delayed emergency medical service response times.[53] The FEIS should provide more quantitative analysis at specific crossings throughout the state, particularly where congestion is greatest. The analysis should also be done with respect to the cumulative impacts of this project alongside many others. For example, the cumulative impacts section observes future rail traffic of 200 trains per day near Spokane—what would be the impact of that level of traffic on emergency vehicles in those communities?

Among the more startling admissions of the DEIS is that the project will proximately cause a substantial increase in the number of rail accidents—a 22% increase statewide. What is not disclosed is any meaningful analysis of the potential safety, human health and environmental risks of such accidents. Just this month, a unit train carrying Bakken crude oil derailed in the Columbia River Gorge near Mosier, Oregon, creating a massive fire and public health emergency, closing an interstate highway, and leaking oil into the Columbia River. Initial reports blamed the incident on track failure. What is undisclosed in the DEIS is how frequent operations of coal unit trains—among the longest and heaviest trains on the rail system—

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[51] *See* Sightline, January 2013, *Who Pays for Freight Rail Upgrades? available at* http://daily.sightline.org/2013/01/18/who-pays-for-freight-railway-upgrades/.

[52] It is not clear whether any of the traffic analysis considers the addition of up to 88,000 trucks carrying the anticipated 2.1 million cubic yards of fill that will be required, a staggering volume that would be concentrated in a single year. DEIS 2-19. This additional truck traffic adds pollution and reduces safety while compounding traffic problems.

[53] Ex. 25. This testimony was prepared for another project nearby, the Tesoro-Savage oil terminal. It addresses a number of factors, such as diesel exhaust, noise, and delay of emergency vehicles, that are pertinent to this project.

contribute to higher-than-normal degradation of rail infrastructure, increasing the risk of accidents. Given the desire to substantially increase the amount of crude oil on the regional rail system, the DEIS needs to look closely at the extent to which the project will contribute not just to accidents generally but to crude oil accidents specifically. Any increase in the risk of a crude oil accident is totally unacceptable.

VI. THE DEIS UNDERSTATES THE IMPACTS AND RISKS TO THE COLUMBIA RIVER, ESTUARY, AND COASTAL WATERS FROM THE COAL TERMINAL

A. The Columbia River Estuary: Ground Zero for Columbia Basin Salmon Recovery

MBT proposes operating the nation's largest coal export terminal in the Columbia River estuary, an area at the center of a regional and national effort to restore endangered and threatened salmonids and other species. The Columbia River estuary extends from the Oregon-Washington coast to Bonneville Dam, located 146-miles upriver. The U.S. Environmental Protection Agency ("EPA") designated the Columbia River estuary as an Estuary of National Significance under the Clean Water Act's National Estuary Program.[54] EPA also designated the Columbia River as one of seven Priority Large Aquatic Ecosystems.[55] The estuary is also an "ecologically critical area," 40 C.F.R § 1508.27(b)(3), that is essential to the survival of juvenile salmon and steelhead, waterfowl, and many other species.[56] The Columbia River estuary contains some of the most biologically productive ecosystems in the world because of the large and concentrated supply of nutrients from the convergence of the Columbia River and Pacific Ocean.[57]

The Columbia River estuary provides vital habitat for salmon throughout the Columbia River Basin.[58] The National Marine Fisheries Service ("NMFS") and U.S. Fish and Wildlife Service ("USFWS") designated the estuary as critical habitat for 17 species of ESA-listed fish and Essential Fish Habitat for Pacific salmon. Multiple studies identify the Columbia River

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[54] EPA, National Estuary Program in Region 10, http://yosemite.epa.gov/R10/ECOCOMM.NSF/6da048b9966d22518825662d00729a35/c7a2ab5e252f309688256fb600779ea6!OpenDocument.

[55] EPA, *Columbia River Basin: State of the River Report for Toxics* (Jan. 2009), http://www2.epa.gov/sites/production/files/documents/columbia_state_of_the_river_report_jan2009.pdf.

[56] NOAA, *Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead* (2011); Fresh *et al*., *NOAA Technical Memorandum NMFS-NWFSC-69: Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead* (2005); 78 Fed. Reg. 2,726 (Jan. 14, 2013) (*Proposed Critical Habitat Designation for Lower Columbia Coho Salmon*).

[57] Western Hemisphere Shorebird Reserve Network, http://www.whsrn.org/site-profile/columbia-river-estuary

[58] *See generally* Exhibit 26 (Williams, Richard N., *Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project* (Jan. 8, 2015)).

estuary as vitally important for juvenile salmonid rearing and endangered species recovery.[59] As one Columbia River expert recently commented, "A growing body of evidence, much of it quite recent (Bottom *et al.* 2005; Roegner *et al*. 2012; Weitkamp *et al*. 2012), provides increasing insight into the important role that shallow water estuarine habitats in the [Columbia River estuary] play in stabilizing production of Columbia River salmon and steelhead."[60] Estuarine habitats provide high growth opportunities for out-migrating juvenile salmon and also provide protection from predators. Research in the Columbia River estuary demonstrates that the estuary is an important staging area where juvenile and adult salmon, steelhead, and trout undergo significant physiological changes that allow transitions to and from saltwater.

Public and private entities have invested, and continue to spend, billions of dollars in efforts to restore the ecological health of the Columbia River Basin.[61] This includes federal agencies' obligations under the Federal Columbia River Power System Biological Opinion ("FCRPS BiOp"). The estuary is ground zero for restoration efforts. For example, the federal government, tribes, states, and others have made significant investments in riparian and wetland restoration projects in the estuary. The federal government has funded—and will continue to fund for the foreseeable future—a significant portion of the salmon restoration efforts in the Columbia River estuary.

Upper Columbia River and Snake River Chinook salmon are essential for the survival of Puget Sound's Southern Resident Killer Whale ("SRKW") population. The birth rate of the SRKW is strongly correlated with the abundance of Chinook salmon. New information shows that abundant runs of Columbia and Snake River Chinook salmon are important to the long-term survival of the SRKW.[62] Juvenile Chinook salmon use the lower Columbia River estuary for migration and sustenance. Adult salmon must migrate along the Columbia River past the proposed Terminal site.

In 2010, the National Marine Fishers Service ("NMFS") listed the Southern Distinct Population Segment of eulachon (*i.e.,* smelt) as threatened under the ESA.[63] NMFS subsequently designated critical habitat for eulachon, which covers the aquatic area of the applicant's proposed dredging and docks.[64] According to NMFS, "[d]redging during eulachon

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[59] NOAA, *Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead* (2011); Fresh *et al*., *NOAA Technical Memorandum NMFS-NWFSC-69: Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead* (2005); 78 Fed. Reg. 2,726 (Jan. 14, 2013) (*Proposed Critical Habitat Designation for Lower Columbia Coho Salmon*).
[60] Exhibit 26 at 5.
[61] *See* Thom, R. *et al.*, Columbia River Estuary Ecosystem Restoration Program, 2012 Synthesis Memorandum, PNNL-21477 FINAL (Jan. 2013).
[62] NOAA, 2015 Southern Resident Killer Whale Satellite Tagging (May 2015), http://www.nwfsc.noaa.gov/research/divisions/cb/ecosystem/marinemammal/satellite_tagging/blog2015.cfm.
[63] 75 Fed. Reg. 13012 (Mar. 18, 2010).
[64] Exhibit 27 (NOAA, *Endangered and Threatened Species; Designation of Critical Habitat for the Southern Distinct Population Segment of Eulachon*, 76 Fed. Reg. 203 (Oct. 20, 2011).

spawning would be particularly detrimental, as eggs associated with benthic substrates are likely to be destroyed."[65]

The Columbia River estuary supports tribal fisheries throughout the Columbia River Basin. Since time immemorial, Columbia River Basin tribes have relied on salmon that depend on the estuary for survival. As the Columbia River Inter-Tribal Fish Commission ("CRITFC") explains:

> To call salmon a staple of the tribal diet would be an understatement. Historically, the typical tribal member ate almost a pound of salmon every day, but salmon represented much more than a source of nutrition—they shaped our societies and our religions.[66]

Indian people have lived in the Columbia River Basin for thousands of years. Salmon is the foundation of their culture and economy. According to conservative estimates, prior to European settlement, the Columbia River's annual salmon returns ranged from 11 to 16 million fish.[67] In 1855, the U.S. government signed treaties with some Columbia River tribes. In these treaties, tribes ceded most of their lands, but reserved the right to fish at "all usual and accustomed fishing places…in common with citizens." CRITFC summarizes the tribes' focus on salmon restoration in the Columbia River Basin:

> Today the tribes are doing everything in their power to make sure that salmon return to as many of their traditional waters as they can. Enormous amounts of resources are being poured into this effort, and tribal youth are joining the fight to save salmon. Every year, more and more tribal members are becoming fish biologists, environmental engineers, and other scientists who are offering their minds as well as their hearts for the protection of the salmon, the water, and ultimately, their traditional way of life.[68]

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[65] *Status Review Update for Eulachon in Washington, Oregon, and California*, Prepared by the Eulachon Biological Review Team at 13019 (Jan. 20, 2010); *see also id.* ("Potential dredging impacts on eulachon consist of direct effects of entrainment of adults and eggs and potential for smother of eggs with sediment . . . Indirect effects may consist of alteration of freshwater spawning habitat and estuarine nursery habitat.") (citations omitted).
[66] CRITFC website, http://www.critfc.org/salmon-culture/we-are-all-salmon-people/.
[67] CRITFC website, http://www.critfc.org/about-us/fisheries-timeline/.
[68] CRITFC website, http://www.critfc.org/salmon-culture/we-are-all-salmon-people/.

Salmon and other fisheries in the Columbia River estuary also support vibrant traditions of non-tribal subsistence, commercial, and sport fishing.[69] The Buoy 10 fishery, spanning the mouth of the Columbia River, is one of the Pacific Northwest's most renowned fisheries.[70]

Despite significant declines in the salmon fishery, commercial fishing in the Columbia River estuary persists. The primary commercial fisheries operating in the Columbia River estuary are gill-netters and crabbers. Gill nets are used on the Columbia River for salmon, sturgeon, shad, and smelt, with salmon as the primary target. In addition to commercial and sport fishing on the Columbia River, a number of ocean fisheries' vessels operate out of the Columbia River.

The Columbia River estuary is a local and regional treasure, and a national priority for watershed health and salmon recovery. For the reasons explained below, MBT will degrade the estuary, harm tribal, commercial, and recreational fisheries, and undermine efforts to restore endangered species. The DEIS does not do an adequate job of disclosing all of the risks and impacts to the Columbia River and the wildlife and communities that rely on it.

B. <u>The DEIS Ignores the Impacts of Increased Vessel Traffic Outside of a Narrow Study Area</u>

The DEIS fails to acknowledge the risks and impacts of vessel traffic in the Pacific Ocean and along the Washington, Oregon, and California coasts. MBT will add 840 vessels per year—1,680 vessel transits—to the Columbia River, the Pacific coastline, and beyond.[71] The DEIS does not disclose potential vessel routes or impacts and risks of vessel traffic along the coastline and in the Pacific Ocean. The risks and impacts of vessel traffic are reasonably foreseeable and must be addressed in the FEIS.

The Co-leads must expand the vessel traffic study area to encompass the foreseeable routes of vessels transiting to and from MBT. When deciding what impacts to address in a DEIS, the Washington Supreme Court explained that an agency "cannot close its eyes to the ultimate probable environmental consequences" of its current action. *Cheney v. City of Mountlake Terrace*, 87 Wn.2d 338, 344 (1976). Nevertheless, the DEIS cuts off the study area for vessel transportation at 3 nautical miles ("nmi") seaward of the Columbia River's mouth.[72] **Coal export vessels servicing MBT would not magically disappear and re-appear three miles from the mouth of the Columbia River.** While three miles is the seaward limit of

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[69] Exhibit 28 (Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife, 2014 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and Other Species, and Miscellaneous Regulations (Jan. 22, 2014)).
[70] Washington Department of Fish and Wildlife, Buoy 10 Creel, http://wdfw.wa.gov/fishing/creel/buoy10/; Lewis and Clark Guide Service website, http://www.lewisandclarkguideservice.com/buoy-10-salmon-fishing/
[71] DEIS at 5.4-35.
[72] DEIS at 5.4-3.

Washington's coastal zone boundary, this jurisdictional boundary has no bearing on the appropriate study area for SEPA analysis.

Examples of vessel traffic impacts and risks beyond the three-mile study area include:

- Disruption or destruction of the near-shore marine and inter-tidal ecosystems.

- Impacts of tanker traffic and potential spills on Washington, Oregon, and California's commercial fishing industries, especially the high-value Dungeness crab fishery. Increased vessel traffic could interfere with commercial fishing activities and spills in the coastal ocean could harm target species, disrupt food webs, and lead to fishery closures or seafood consumption bans.

- Impacts to coastal tourism and recreation. The DEIS acknowledges that, within the study area, an increase in vessel traffic increases the risk of a fuel spill or accident involving an oil tanker resulting in an oil spill.[73] An oil spill into the coastal ocean off of Washington, Oregon, or California could have disastrous consequences for local economies. For example, an oil spill could precipitate beach closures or deter people from using beaches for walking, swimming, surfing, fishing, razor-clamming or other traditional activities, resulting in significant loss of revenue for coastal communities in addition to the incalculable environmental harm.

- Impacts to human health and safety, including exposure to toxic substances for individuals attempting to clean up oil spills.

- Increase in ship strikes and acoustic disturbance to whales and other marine life. By illegally constricting the vessel and wildlife study areas,[74] the DEIS gives readers the impression that the impacts of ship traffic on marine mega-fauna will be insignificant or non-existent. However, a NMFS Biological Opinion for a Columbia River crude oil terminal concluded that oil tankers exiting from the Columbia River are "substantially certain" to collide with, and acoustically disturb, threatened and endangered marine mammals and leatherback sea turtles.[75] Washington courts require reasonably thorough disclosure and discussion of environmental impacts and sufficient information to make a reasoned decision. *Klickitat County Citizens Against Imported Waste v. Klickitat County*, 122 Wn.2d 619, 633 (1993). The DEIS's consideration of impacts to whales and other marine life fails to meet this standard.

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[73] SEPA Vessel Transportation Technical Report at 3-13 (April 2016).
[74] The DEIS restricts the wildlife study area for aquatic species and habitats to approximately 5.1 miles upstream and 2.1 miles downstream from the upstream and downstream ends of the proposed docks. DEIS at 4.8-3.
[75] Exhibit 29 (NMFS, *Final Biological Opinion for Columbia Pacific Bio-Refinery Dock Expansion* at 7 (June 8, 2015)).

Overall, limiting the study area to the three nautical miles in front of the mouth of the Columbia obscures the risks and impacts of MBT's project.

C. The DEIS Demonstrates Significant Impacts from a 44% Increase in Columbia River Vessel Traffic

MBT would generate a staggering volume of deep-draft vessel traffic in the Columbia River estuary. According to the DEIS, **MBT would generate more deep-draft vessel traffic than any single public port in the Columbia River Basin**.[76] For the reasons described below, the DEIS ignores and understates the significant ecological impacts of adding 1680 deep-draft vessel transits to the Columbia River estuary each year.

1. Wake stranding caused by MBT's vessel traffic would injure and kill ESA-listed salmonids and other species.

Vessel wakes from deep-draft bulk cargo vessels calling at MBT would kill and injure juvenile salmon, steelhead, and other fish in the Columbia River. Wake stranding occurs when a wave caused by a vessel wake lifts an aquatic organism onto the shoreline. NMFS identifies ship wake stranding as a limiting factor for recovery of Lower Columbia River ("LCR") Chinook salmon, Columbia River chum, LCR coho salmon, and LCR steelhead, with juvenile ocean–type Chinook originating from LCR tributaries and CR chum being particularly vulnerable.[77]

The DEIS does not dispute the impact of wake stranding on fish. The DEIS states: "A growing body of evidence indicates that juvenile salmon and other fish are at risk of stranding on wide, gently sloping beaches because of the wakes generated by deep draft vessel passage."[78] The DEIS describes studies analyzing the wake stranding in the Lower Columbia River, stating:

> Studies indicate that juvenile salmon and other fish are at risk of stranding on wide, gently sloping (i.e., less than 5% slope) beaches as a consequence of wakes generated by deep-draft vessel passage (Bauersfeld 1977; Hinton and Emmett 1994; Pearson et al. 2006; ENTRIX 2008). Depending on various factors—such as the slope and breadth of a beach, river stage, tidal stage, depth of water vessel in transiting, and vessel size—direction of travel and speed, wakes from passing vessels can travel a considerable distance. When these wakes meet the shoreline, they can carry fish and deposit them, essentially stranding them on the beach where they are susceptible to stress, suffocation, and predation before than [sic] can return to the water.[79]

[76] DEIS at 5.4-18–19.
[77] Exhibit 29 at 86.
[78] DEIS at 4.7-18.
[79] DEIS at 4.7-31–32.

Studies on wake stranding in the Lower Columbia River conclude that "certain sites appear to be more susceptible to stranding than others."[80]

NMFS' recent Biological Opinion ("BiOp") for dock work at the Columbia Pacific Bio-Refinery, located downstream of MBT at Port Westward, provides a detailed summary of research on wake stranding in the Columbia River estuary.[81] The dock work would facilitate a 7% increase in large-ship vessel traffic in the Columbia River estuary.[82] After analyzing research on wake stranding in the estuary, NMFS concluded that vessel traffic calling on the Bio-Refinery's dock would "likely increase the incidence of stranding and death of all populations of juvenile salmonids and eulachon."[83]

The DEIS discloses significant impacts to endangered salmonids and other fish from MBT's vessel traffic, which would increase large vessel traffic on the Columbia River 44% over 2014 traffic levels.[84] In particular, the DEIS concludes: "The Proposed Action would add 840 vessel transits to the Columbia River at full build-out, which would introduce additional **permanent risk of fish stranding** in the Columbia River."[85] The Co-leads should revise the DEIS to include a more robust analysis of impacts from wake stranding.

- The DEIS does not attempt to quantify the impact of 840 vessel transits per year on wake stranding. While the DEIS describes a "growing body" of research on the impacts of large vessel traffic on wake stranding, the DEIS does not use these studies to project the impact of 840 vessel transits per year on wake stranding along the Columbia's shoreline. The Co-leads can utilize data on wake stranding in the lower Columbia. For example, in 2004 and 2005, researchers monitored 126 deep-draft vessel transits at three beaches along the Lower Columbia River.[86] Along a 300-meter stretch of shoreline at Barlow Point (just downstream from MBT), researchers observed 26 different deep-draft vessel transits, which resulted in the total wake stranding of 351 juvenile chinook salmon (an average of 13.5 juvenile chinook stranded per deep-draft vessel transit).[87] NMFS Biological Opinion for the Columbia Pacific Bio-Refinery summarizes studies from the lower Columbia documenting the impacts of wake stranding. The Co-leads can use data from wake-stranding studies to extrapolate MBT's impact on ESA-listed fish.

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[80] *Id.* at 4.7-19.
[81] Exhibit 29 at 85–86.
[82] *Id.* at 87.
[83] *Id.* at 86.
[84] DEIS Vessel Transportation Fact Sheet at 2.
[85] DEIS at 4.7-19 (emphasis added).
[86] Exhibit 30 (Pearson *et al.*, *A study of stranding of juvenile salmon by ship wakes along the lower Columbia River using a before-and-after design—before-phase results* (2006)).
[87] *Id.* at 9, 48.

- The DEIS fails to analyze the impact of wake stranding on ESA-listed eulachon. The Tesoro-Savage DEIS, released by the Washington Energy Facility Site Evaluation Council ("EFSEC") in January 2016, analyzed the impact of vessel traffic from that project on eulachon. The Tesoro-Savage DEIS concluded that wake stranding "could result in a moderate to major long-term effect on nearshore fish including listed salmonids and eulachon."[88]

- The DEIS does not discuss wake stranding along Columbia and Willamette River shorelines **upstream** of the terminal. The DEIS discusses beaches susceptible to wake stranding from the Columbia mouth to the terminal. The DEIS, however, acknowledges that vessels transporting coal to and from the terminal may use anchorages upstream of the terminal site, including anchorages at the Ports of Kalama, Woodland, Vancouver, and Portland.[89] In turn, the DEIS's vessel traffic study area reaches to the Port of Vancouver, Port of Portland, and Willamette River. Without explanation, the DEIS fails to analyze wake stranding impacts within the designated study area upstream of the terminal.

For the reasons described above, the DEIS underestimates the project's impact on wake-stranding.

The DEIS concludes that MBT would introduce "additional permanent risk of fish stranding in the Columbia River." The DEIS fails to propose any voluntary measures or mitigation to address the loss of endangered and threatened species from wake stranding.[90] Nonetheless, the DEIS concludes that "[c]ompliance with laws and implementation of the voluntary measures and mitigation measures described above would reduce impacts on fish" and "[t]here would be no unavoidable and significant adverse impacts." This conclusion contradicts the DEIS's own findings. Just five pages before reaching the "unavoidable and significant adverse impacts" conclusion, the DEIS states:

> In 2028, with full coal terminal export throughput, the Proposed Action would represent approximately 27% of the projected vessel traffic volume in the lower Columbia River. The additional traffic associated with the Proposed Action would result in increased risk of fish stranding.

As noted above, the DEIS makes no effort to quantify projected fish mortality from wake stranding up- and downstream of the terminal.

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[88] Exhibit 31 (Tesoro-Savage DEIS at 3.6-54).
[89] DEIS at 5.4-7 (map of anchorages vessels calling on MBT would use, including anchorages upstream at the Ports of Kalama, Vancouver, Woodland, and Portland); *see also id.* at 5.4-9–11 (discussing anchorages upstream and downstream of MBT).
[90] DEIS at 4.7-35–37 (describing potential mitigation measures for fish impacts); *id.* at 5.4-47(describing potential mitigation measures for vessel traffic impacts).

The DEIS contains a qualitative conclusion that the MBT will increase the risk of wake stranding. However, the DEIS never connects MBT's impact from wake stranding with a mitigation measure. Instead, the wake stranding section trails off with a one paragraph commentary on vessel operation oversight by federal agencies.[91] The DEIS does not identify how federal regulation would address or mitigate impacts from wake stranding.

In sum, the DEIS: (1) discloses significant impacts from vessel traffic, (2) fails to identify voluntary measures or mitigation to off-set these impacts, and (3) contradicting the DEIS's own finding that MBT "would introduce additional permanent risk of fish stranding in the Columbia River,"[92] concludes "[t]here would be no unavoidable and significant adverse impacts" to fish. The Co-leads must revise the DEIS to conclude, consistent with the DEIS's disclosure on the project's impacts from wake stranding, that there would be unavoidable and significant adverse impacts to fish. Such impacts must either be mitigated, or the DEIS should include a clear conclusion that they cannot be.

The coalition anticipates that MBT may propose altering vessel transit speeds in areas more susceptible to wake stranding. The Co-leads should reject this unproven form of mitigation. In Columbia Pacific Bio-Refinery BiOp, NMFS noted that reducing vessel speed in the lower Columbia River to mitigate wake stranding is probably infeasible "primarily because of the lost revenues that would result from slower ship travel" and because "the speed of ships traveling through the estuary may be difficult to alter because of safety issues."[93]

2. The DEIS contains an incomplete and flawed analysis of oil spill risks.

The DEIS understates oil spill risks associated with increasing deep-draft vessel traffic by 44% over 2014 levels. The DEIS technical report on vessel traffic states:

> Risks of oil spills involving diesel or heavy fuel oil during transit could occur as the result of an incident or during bunkering transfers at locations other than the dock. The Applicant has committed to not allowing vessel bunkering from barges or tanker trucks at Docks 2 or 3. If an incident occurred that resulted in an impact, there is a possibility that a fuel tank could be damaged and fuel spilled. Oil spills could also occur during bunkering at anchorages within the study area. In general, the risks of spills would increase under the Proposed Action due to an increase in the number of vessels calling at the project area and the resultant increase to overall vessel traffic in the study area.[94]

To provide additional information about the relative likelihood of various sized oil spills, the

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[91] DEIS at 4.7-32.
[92] DEIS at 4.7-19.
[93] Ex. 29 at 86 (Columbia Pacific Bio-Refinery BiOp).
[94] SEPA Vessel Transportation Technical Report at 3-13 (April 2016).

DEIS risk assessment quantitatively evaluated the incremental increase in risks of a spill in the event of a collision or grounding. The DEIS does not include a qualitative or quantitative risk analysis of bunkering (*i.e.,* refueling). The DEIS, however, acknowledges oil spill risks associated with bunkering, stating:

> Increased vessel traffic associated with the Proposed Action also has the potential to result in an increased risk of oil spills during bunkering activities. Causes of oil spills during bunkering transfers include overflow of the tank, parting the hose due to mooring fault, operator error in connecting the hose, failure of the hose or pipework, and failure of bunker tanks (HSE 2012). Experience from insurance claims (Gard 2002) is that most bunker spills result from an overflow of the bunker tank due to carelessness or negligence, either on the part of those supplying the bunkers, or those on board the vessel receiving them.[95]

The DEIS notes that utilizing best practices during bunkering is the best safeguard against bunkering spills.[96] The DEIS makes a preliminary effort to quantify the risk of a bunkering spill, but falls short. In particular, the DEIS describes projections on the frequency of spills during bunkering, stating:

> Spills of oil cargoes are better documented than spills from bunkering. Therefore, previous risk analyses (DNV GL 2011) have assumed the frequency of spills during bunkering is the same as during transfer of liquid cargoes: 1.8×10^{-4} (.00018) per bunkering operation for spills exceeding 1 metric ton (7.3 barrels or 308 gallons). The frequency of smaller spills is likely to be much greater. This implies that the annual likelihood depends on the number of bunkering operations. If the vessel bunkers 10 times per year, the likelihood of a spill of 1 metric ton or more would be 1.8×10^{-3} (.0018 or .00018*10) per year, or approximately 1 chance in 500 per year.[97]

The DEIS notes that there were nine oil spills during refueling of large cargo vessels in the study area from 2004 to 2014.[98]

The DEIS cuts short the bunkering oil spill risk analysis. The DEIS fails to analyze the risk of bunkering spills from 840 new, deep-draft vessels servicing MBT. Nonetheless, the DEIS vessel traffic technical report concludes: "Although it is not possible to predict the number of vessels that may bunker or where they would bunker, the risks of a spill during transfer would

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[95] *Id.*
[96] *Id.*
[97] *Id.* at 3-14.
[98] DEIS at 5.4-45.

increase slightly due to the increase in vessel trips under the Proposed Action." The DEIS fails to provide any technical support for its conclusion characterizing the increased risk of a bunkering spill as "slight."

In general terms, the DEIS describes the impacts of a bunker fuel spill in the "marine environment," but fails to analyze potential impacts in the Columbia River estuary, a confined estuarine environment. Specifically, the DEIS technical report states:

> The consequences of a spill of heavy fuel oil into the marine environment are, in general, considered to be more severe than for other fuels, although this may depend on the sensitivity of the local environment to acute toxicity (DNV GL 2011). Undoubtedly, spills of heavy fuel oil will be more persistent, taking longer to weather naturally and being more difficult to clean-up.[99]

The DEIS identifies ports and anchorages where bunkering may occur, *see* Figure 5.4-1, but fails to analyze the consequences of a bunkering spill at potential bunkering locations within the estuary or other locations. **The Co-leads must revise the DEIS to address the impacts of a bunker oil spill at different locations in the Columbia River estuary and at other potential bunkering locations**.

D. <u>The DEIS Understates Shoreline Erosion and Associated Impacts to Shoreline Vegetation from Increased Vessel Traffic.</u>

The Co-leads must revise the DEIS to connect MBT's impacts on shoreline erosion and vegetation with the conclusions reached. The DEIS discloses significant impacts from vessel traffic on shoreline erosion and shoreline vegetation.[100] For example, DEIS Appendix F states:

> Vessels transiting the Columbia River would create vessel wakes, which have the potential to impact riparian vegetation directly through breakage, swamping, and erosion and indirectly through altered patterns of erosion and deposition and spread of noxious weeds. Vessel wakes are most likely to affect shoreline vegetation communities at or near water level. Wakes can redistribute fine sediment that can smother aquatic vegetation, but can also provide substrate for colonization of emergent wetland plants. Vessels traveling up and down the Columbia River could assist with dislodging (with wakes) and facilitating waterborne transport of wetland and riparian zone invasive exotic plants.[101]

Despite disclosing a litany of significant impacts, the DEIS concludes "[t]here would be no

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[99] SEPA Vessel Transportation Technical Report at 3-14.
[100] DEIS 4.6-23–24.
[101] DEIS Appendix F at F-8.

unavoidable and significant adverse environmental impacts" to shoreline erosion and vegetation.[102] The DEIS does not identify mitigation to reconcile its findings on impacts with the "no unavoidable" and "not significant" conclusions.

The DEIS addresses the impacts of vessel traffic on shoreline erosion and vegetation in Chapter 4.6, *Vegetation*. The DEIS states:

> Increased vessel traffic and associated wakes could contribute to erosion of tidal marsh vegetation along the shoreline of the Columbia River. Operation of the coal export terminal at maximum throughput would deliver 70 vessels per month or 840 vessels per year to Docks 2 and 3 and would equate to1,680 vessel transits a year (840 vessels each way) (Chapter 5, Section 5.4, Vessel Transportation). The location and extent of these impacts would depend on vessel design, hull shape, vessel weight and speed, angle of travel relative to the shoreline, proximity to the shoreline, currents and waves, and water depth (Jonason 1993:29–30; MARCOM 2003). The potential for shoreline erosion could also be influenced by the slope and physical character of the shoreline (i.e., soil susceptibility to erosion), as well as the amount and type of vegetation that occurs along the shoreline.[103]

The DEIS concludes that vessel traffic may impact shoreline erosion and vegetation at the terminal and along the vessel route. Specifically, the DEIS states:

> [T]here may be a potential for such impacts [*i.e.,* shoreline erosion] on the thin strip of shoreline vegetation along the northern end of Lord Island from large wakes, or wakes oriented perpendicular to the main navigation channel and docks, such as those that can occur when tugs are oriented perpendicular to the shoreline as they push vessels into position at docks. There is the potential for impacts related to vessel wakes on vegetation along the shoreline of the lower Columbia River as a result of the Proposed Action.[104]

The DEIS also notes that: (1) vessel operations in the Lower Columbia River are federally regulated, including size, speed, and navigation; (2) large vessels must be operated by U.S. Coast Guard-licensed pilots within the Lower Columbia River; and (3) the Corps manages the navigation channel and its ongoing maintenance.[105] The DEIS fails to explain how these factors will reduce or mitigate for shoreline erosion from MBT's vessel traffic.

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[102] DEIS at 4.6-27.
[103] DEIS at 4.6-23.
[104] *Id.* at 4.6-23.
[105] *Id.*

Like the DEIS's treatment of wake stranding, the DEIS's treatment of vessel traffic's impacts on shoreline erosion and shoreline vegetation is arbitrary. The DEIS discloses significant impacts from vessel traffic on shoreline erosion and vegetation, fails to identify mitigation or how compliance with federal laws will alleviate these impacts, and, nonetheless, concludes that the project's impacts are not significant or unavoidable.[106] The Co-leads must revise the DEIS to link its findings with its conclusion.

In comments on a proposed liquefied natural gas ("LNG") terminal, Bradwood Landing, the Oregon Department of Environmental Quality (DEQ) notes that studies by the Corps found an impact from deep-draft vessels on shoreline erosion. DEQ's comments state:

> Corps studies related to channel deepening in the proposed reach have found wake from current ship traffic to be largely responsible for erosion at Puget Island. The DEIS incorrectly identifies speed as the most important influencing factor in ship wake erosion. The Corps studies have found vessel hull shape to be the contributing factor in ship wake erosion with severity dependent on tidal stage during travel. No information on vessel hull shape and tidal stage correlation is provided in the DEIS analysis. Additionally, tug boat wake from multiple boats during berthing and unberthing should be analyzed in combination with wake and propeller wash from the vessels.[107]

The MBT DEIS contains the same flaws DEQ identified in the Bradwood LNG DEIS, a project with only a fraction of the vessel traffic (*i.e.,* 125 vessels per year). The Co-leads must revise the DEIS to account for significant impacts from 840 vessels per year calling on MBT.

E. <u>Vessel Traffic Impact on Sediment and Water Quality</u>

The DEIS does not provide adequate detail about the potential to re-suspend contaminated sediments due to vessel movement and prop wash. Sediments contaminated with PAHs, PCBs, and PBDEs exist along the Lower Columbia River, and vessel traffic remobilization of bed materials may transport and redistribute existing contaminants. Resuspension of existing contaminants would likely violate water quality standards, which could not be readily prevented or otherwise mitigated.

The DEIS fails to disclose contaminated sediment and a pending cleanup action at MBT.[108] Chemical analyses of sediments at the site revealed one location near Outfall 002A where PAHs exceeded screening levels. Near Outfall 002A, sediments exceeded bioassay performance standards. Accordingly, Ecology Agreed Order Amendment No. 9040 requires

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[106] *Id.* at 4.6-26–27.
[107] Ex. 32 (Oregon DEQ Comments on Bradwood Land LNG DEIS).
[108] Ex. 33 (Ecology Agreed Order Amendment No. 8940).

dredging of up to 5,000 cubic yards of contaminated sediments. The Co-leads should analyze sediment samples from MBT and incorporate those analyses in the FEIS.

In addition, the DEIS fails to address comments raised in the Washington Department of Natural Resources' ("WDNR") scoping comments. WDNR's comments state:

> The greatly increased ship activity has the potential to impact sediment quality. Diesel burning by the ships can create greenhouse gases, PAHs and dioxins, which can contribute to localized ocean acidification as well as contaminate the sediments in the area through atmospheric deposition, especially if diesel fuel is burned while the container ships are idling while at the terminal.[109]

WDNR requested that the Co-leads "analyze the cumulative impacts of engine exhaust from the cargo vessels and tugs and upland machinery operations, and the potential for pollutants to [enter] the Columbia River from atmospheric deposition, or from vessel machinery, or loading operations."[110] An analysis of the Morrow Pacific coal export terminal showed nitrogen deposition into the Columbia River many times above the ecological screening level of 5 kg/ha/yr.[111] These impacts crossed state boundaries. The Morrow Pacific analysis supports incorporating WDNR's request to analyze atmospheric deposition from multiple sources in the FEIS.

F. Entrainment and Impingement of Aquatic Organisms.

The DEIS does not address impingement and entrainment of aquatic organisms in the water intakes of vessels calling on MBT. Entrainment is the direct uptake of aquatic organisms by the suction field generated by water intakes on vessels, while impingement refers to organisms becoming trapped against an intake screen. The DEIS *SEPA Fish Technical Report* notes that entrainment occurs in the context of dredging, but fails to address entrainment from vessels.

The FEIS should describe the water intake structures on the tanker vessels, explain the rate and amount of water taken in by each ship, and explain (through literature review or actual sampling) the densities at which larval fish and fish eggs are likely to be present in the Lower Columbia River and therefore susceptible to entrainment or impingement. None of these figures would be particularly difficult to ascertain, but without them, readers of the DEIS have no information on the impacts of entrainment resulting from MBT.

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[109] Ex. 34 at 9 (Washington Department of Natural Resources Scoping Comments on the Millennium EIS (Nov. 18, 2013)).
[110] *Id.*
[111] Ex. 35 at 25 (Fox, Phyllis, *Fugitive Particulate Matter Emissions from Coal Train Staging at the Proposed Coyote Island Terminal*, Final Report, prepared for Sierra Club, San Francisco, CA (July 19, 2013)).

G. Reasonable Alternatives to Reduce Vessel Traffic Impacts

The DEIS fails to disclose reasonable alternatives to vessel traffic patterns and operations to reduce the project's adverse impacts to fish, water quality, and shoreline erosion. The DEIS again ignores WDNR's scoping comments. WDNR recommended that the DEIS "analyze alternative berthing times and seasonal restrictions to ensure that cargo vessel and tug operations do not adversely affect the spawning and migration behavior of salmon, eulachon, sturgeon, and other species that utilize the proposed project area." The DEIS lacks the analysis requested by WDNR.

Information disclosed in the DEIS supports an alternatives analysis on vessel traffic operations. The DEIS acknowledges vessel maneuvering challenges at the existing dock:

> Currently, maneuvering a vessel to the existing berth (Dock 1) can be challenging upstream of the project area due to the strong current outflow from the bank (Amos pers. comm.). [River] Pilots expect that conditions for the proposed docks (Docks 2 and 3) would be the same as they are at Dock 1 (Gill pers. comm.). Pilots would be aware of this issue and would consider it during planning and operations.[112]

While the DEIS discloses vessel maneuvering challenges, the DEIS does not evaluate alternative dock designs to address known risks. Likewise, the DEIS does not incorporate the known challenges of docking at Dock 1 into the oil spill risk analysis for Docks 2 and 3.

H. Terminal Construction Impacts on the Columbia River

1. Failure to analyze reasonable alternatives to the proposed dock and dredging designs.

The DEIS lacks any analysis of alternative dock configurations and alternatives to the quantity and size of the proposed dredge prism. WAC 197-11-440(5)(d) states in part: "When a proposal is for a private project on a specific site, the lead agency shall be required to evaluate only the no-action alternative plus other *reasonable alternatives for achieving the proposal's objective on the same site*" (emphasis added). The DEIS fails to consider reasonable alternatives to achieving MBT's objectives at the site.

First, the DEIS fails to evaluate alternative dock alignments and associated impacts on endangered species and other aquatic life. WDNR requested a dock and dredge prism alternatives analysis in the agency's scoping comments, stating:

> The EIS should include a comprehensive analysis of alternatives to the proposed project design. The analysis should assess the

[112] DEIS at 5.4-36.

> potential adverse impacts and mitigation measures for each alternative. Alternative overwater structure designs should be evaluated to identify designs that avoid and minimize impacts, such as minimizing the number of pilings required, minimizing the coverage area of new overwater structures, using alternative decking materials, and minimizing artificial light.[113]

The DEIS lacks the alternatives analysis required under WAC 197-11-440(5)(d) and recommended by WDNR.

Second, the DEIS fails to analyze reasonable alternatives to dredging 48-acres of the Columbia River. Again, the DEIS ignores the requirements of WAC 197-11-440(5)(d) and WDNR's scoping comments. The Co-leads should analyze alternative dock configurations that would minimize the initial and ongoing dredging requirements. WDNR's scoping comments recommend that the Co-leads analyze using smaller, shallower-draft transport and ship loading equipment designs. The DEIS lacks this analysis.

Third, the DEIS fails to analyze utilizing the existing dock, Dock 1. MBT has stated on the record that it will not use Dock 1 for coal export.[114] In turn, the Co-leads and other agencies have authorized rebuilding and maintenance dredging to facilitate safe, ongoing operations at Dock 1. The public and agencies have relied on Millennium's statements that Dock 1 would not be used for coal export. The Coalition does not support coal export at Dock 1 or any new docks. However, the DEIS should nonetheless analyze the alternative of utilizing an existing dock and dredge prism before destroying additional critical habitat in the Columbia River.

The Co-leads must revise the DEIS to consider reasonable alternatives to MBT's proposed dock and dredging proposal.

2. Direct and indirect impacts of dock construction and dredging.

Construction of the trestle and dock structures will impact salmon, eulachon, and other

[113] WDNR Scoping Letter at 1.
[114] Exhibit 36 (Letter from MBT to Cowlitz County (Sept. 19, 2011)).

aquatic life.[115] MBT proposes placing 610, 36-inch pilings below the high-water mark.[116] MBT also proposes altering a 48-acre area of benthic habitat in the deep-water zone by removing approximately 500,000 cubic yards of benthic sediment to achieve a depth of -43 feet Columbia River Datum (CRD), with a 2-foot overdredge allowance.[117] MBT would increase water depth in the dredge prism by up to 16 feet.[118] The DEIS concludes that "[c]ompliance with laws and implementation of the voluntary measures and mitigation measures . . . would reduce impacts on fish" and "[t]here would be no unavoidable and significant adverse impacts." Impacts disclosed in the DEIS in concert with unproven and undisclosed mitigation render this conclusion arbitrary.

The DEIS identifies substantial impacts from dock construction and dredging. These impacts include:

- temporarily altering or permanently removing aquatic habitat in the Columbia River adjacent to the project area;[119]
- permanently altering a 48-acre area of benthic habitat in the deep-water zone by removing approximately 500,000 cubic yards of sediment;[120]
- temporarily increasing turbidity, which is associated with behavioral impacts on fish (avoidance, disorientation, decreased reaction time, increased or decreased predation and increased or decreased feeding activity);[121]

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[115] Exhibit 37 (Minimizing Effects of Over-Water Docks on Federally Listed Fish Stocks in McNary Reservoir: A Literature Review for Criteria, prepared by the U.S. Geological Survey for the U.S. Army Corps of Engineers (2010) (prepared in support of criteria for siting new docks in the McNary Pool of the Columbia River, this report recommends, among other things: (1) pilings shall not exceed 5 inches in diameter, (2) each over-water structure shall utilize no more than 6 piles for the entire project, and (3) nothing shall be placed on the over-water structure that will reduce natural light penetration through the structure)); Overwater Structures and Non-structural Piling White Paper, prepared by Jones & Stokes Associates for the Washington Department of Fish and Wildlife (2006) (summarizes scientific literature documenting the direct, indirect, and cumulative impacts of overwater structures, including industrial docks, to ESA-listed salmonids and other aquatic life); Exhibit 38 (Over-water Structures: Freshwater Issues, prepared by Herrera Environmental Consultants for the Washington Departments of Fish and Wildlife, Ecology, and Transportation (2001) (comprehensive overview of scientific literature, current through late-2000, describing the impact of pilings and docks on aquatic life, including increased predation, decreased habitat quality, and degraded water quality)).
[116] DEIS at 4.5-21.
[117] *Id.* at 4.7-22.
[118] *Id.*
[119] *Id.* at 4.7-22.
[120] *Id.*
[121] *Id.* at 4.7-23.

- noise attenuation and fish movement models predicted that underwater noise thresholds would be exceeded, resulting in injury or behavior impacts, at distances ranging from 45 feet (single strike) to 3.92 miles (cumulative sound);[122]

- "adult salmon migrating through the study area could be injured by pile-driving noise" (temporary and long-term hearing damage, permanent reductions in sensitivity, and, overall, reduced fitness);[123] and

- changes to primary productivity, fish behavior, predation, and migration caused by overwater structures, barges, and vessels required for construction.[124]

The DEIS also identifies direct impacts to salmonids and other fish from MBT operations. These include:

- increased shading from Docks 2 and 3 and large vessels, which could result in changes to primary productivity fish behavior, predation, and migration;[125]

- noise impacts from vessel traffic;[126] and

- deposition of 1.88 grams per square meter per year from fugitive coal dust.

Despite the impacts disclosed, the DEIS concludes that there would be no unavoidable and significant adverse impacts to fish. The mitigation described in the DEIS does not support this conclusion. The DEIS points to compliance with laws and the implementation of voluntary and mitigation measures. The DEIS, however, fails to specify any details about mitigation aside from applicant mitigation. For example, the DEIS notes that the Corps will require compensatory mitigation "for the acres and functions of the affected wetlands."[127] But MBT failed to identify compensatory mitigation as part of the DEIS. Indeed, the DEIS is explicit that mitigation is going to be developed *in the future*, in plain violation of law. DEIS 4.7-20.[128] As a result, MBT cut-off public, agency, and tribal government input on the adequacy of mitigation to off-set the project's impacts.

It is unclear how the DEIS can conclude the project will have no unavoidable or significant adverse impacts on fish without identifying and reviewing the adequacy of compensatory mitigation. Such a conclusion weakens the public's confidence in the integrity of the document.

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[122] *Id.* at 4.7-24.
[123] *Id.* at 4.7-26.
[124] *Id.*
[125] *Id.* at 4.7-27.
[126] *Id.* at 4.7-29.
[127] *Id.* at 4-7-35.
[128] *See Quinault Indian Nation*, *supra*, at *15 (invalidating an MDNS which proposed that mitigation be developed in the future).

Weighing the impacts disclosed in the DEIS against MBT's "Applicant Mitigation" does not support the "no unavoidable impacts/no significant adverse impacts" conclusion. For example, MBT proposes mitigation measure ("MM") FISH-4, "Conduct Eulachon Surveys." Under this mitigation measure, MBT would "conduct underwater surveys for eulachon spawning and larval activity within those areas where in-water work will occur (i.e., Docks 2 and 3 and the dredge prism)" and "coordinate with fish and wildlife agencies on appropriate measures to avoid and minimize impacts to spawning and larval eulachon."[129] MBT proposed its coal export project over six years ago. Why are eulachon surveys characterized as a "mitigation measure" when the applicant could have conducted these studies prior to the DEIS and utilized the studies to influence project design and reasonable alternatives?

In addition, several MBT mitigation measures contain undefined language with no clear path to ensure compliance. MM CDUST-3, "Reduce Coal Dust Emissions from Rail Cars," is a poster child for the weak and undefined mitigation that characterizes MBT's fish mitigation. Under this mitigation measure, MBT "will work with rail companies to implement advanced technology for applicants of surfactants along the rail routes for Proposed Action-related trains." If MBT is aware of "advanced technology," the applicant should identify this technology in the DEIS, the Co-leads should analyze the efficacy of the "advanced technology," and the Co-leads should require MBT to utilize this technology. As a practical matter, MM CDUST-3 reads like other mitigation measures: weak, undefined, and potentially meaningless.

3. Cumulative impacts of dock building, dredging, and maintenance dredging on water quality and fish.

Degradation of fish habitat and water quality in the Columbia is the product of cumulative impacts: no single project or action has resulted in damaged habitat and compromised water quality in the Columbia. Rather, salmon are listed and their habitat protected because of the cumulative impacts of multiple individually minor actions that, taken together, have resulted in drastic modification of the system. This project proposes to add to that steady loss of habitat and ongoing degradation of water quality. That's why the cumulative impacts analysis is particularly important. However, the DEIS's cumulative impacts analysis contains two substantial flaws.

First, the analysis ignores the existing dock at MBT, Dock 1, which has obtained multiple in-water work permits and maintenance dredging permits in recent years.[130] The Co-leads must revise the DEIS to account for Dock 1 and ongoing water quality impacts from the maintenance of Dock 1 and its dredge prism.

Second, the DEIS fails to analyze cumulative impacts from past and present activities, instead restricting the analysis to cumulative impacts from the project and reasonably foreseeable future actions. The first sentence of DEIS Chapter 6, *Cumulative Impacts*, states "Cumulative impacts are impacts that would result from the incremental addition of the Proposed Action to

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[129] DEIS at 4.7-36.
[130] *Id.* at 6-26.

impacts from *past, present,* and reasonably foreseeable future actions."[131] While the DEIS acknowledges that cumulative impacts include past and present actions, the DEIS makes the arbitrary decision to exclude past and present actions from the substance of the cumulative impacts analysis on water quality and fish impacts. In particular, the DEIS states: "The cumulative impacts study area for water quality impacts due to on-site activities is the project area (including dredged material disposal sites), the CDID #1 stormwater system drainage ditches adjacent to the project area, and the Columbia River Segment 2 (river miles 37 to 72)."[132] The DEIS identifies the following projects in the study area: the Barlow Point Master Plan Project, the Northwest Innovation Works facility at Port Westward, the Columbia Pacific Bio-Refinery, the Riverside Refinery, Washington Energy Storage & Transfer, and the Kalama Manufacturing and Marine Export Facility. These projects are identified in DEIS Chapter 6 as "reasonably foreseeable future actions." Failure to account for past and present actions renders the DEIS's cumulative impacts analysis flawed.

I. The DEIS Understates the Impacts of Coal Dust on the Columbia River.

Coal export terminals have been in operation around the world for decades. We know from experience that they are notoriously dirty. The DEIS, however, concludes that coal dust from MBT will have no unavoidable or significant impacts on the Columbia River. This conclusion is inconsistent with the actual evidence in the DEIS, and ignores significant information that was readily available. Coal dust pollution at the terminal site and along the rail line is a major concern that the decisionmakers and the public need to understand.

The DEIS ignores literature from around the world documenting the significant, detrimental impacts of coal terminals adjacent to waterbodies.[133] The DEIS also fails to examine the effectiveness of best management practices employed at other coal terminals. MBT proposes best management practices to reduce fugitive coal dust and the DEIS assumes, without supporting rationale, that the BMPs will be effective. For the reasons described in Section VI below, the DEIS greatly underestimates fugitive coal dust from the terminal, including coal dust entering the Columbia River. The Co-leads must revise the DEIS to: (1) evaluate the effectiveness of proposed BMPs based on real-world applications, (2) consider additional scientific literature on the impacts of coal dust on water quality and aquatic life, and (3) consider third-party modeling of fugitive coal dust from the terminal.

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[131] *Id.* at 6-1 (emphasis added).
[132] *Id.*
[133] Ex. 39 (Bounds, William J. and Johannesson, Karen H., *Arsenic additions to soils from airborne coal dust originating at a major coal shipping terminal*, 185 Water Air and Soil Pollution (2007)); Ex. 40 (Johnson, Ryan and Bustin, R.M., *Coal dust dispersal around a marine coal terminal (1977-1999), British Columbia: The fate of coal dust in the marine environment*, 68 International Journal of Coal Geology (2006)); Ex. 41 (Levings, C.D., *Juvenile Salmonid Use of Habitats Altered by a Coal Port in the Fraser River Estuary, British Columbia*, 16 Marine Pollution Bulletin 6 (1985)); Exhibit 42 (Evaluation of Coal Dust and Spillage Control Measures Alaska Railroad Corporation, Aurora Energy Services, LLC Coal Terminal Seward, Alaska, Expert Report of Steven Klafka (Mar. 7, 2012)).

1. The DEIS underestimates the amount of fugitive coal dust in the Columbia.

The DEIS relies on a flawed model to project the amount of coal dust released by MBT. The DEIS acknowledges multiple pathways for coal dust to enter the Columbia River, stating:

> Coal and coal dust could enter the Columbia River directly or via the surrounding drainage channels from spills during loading or unloading or through airborne transport of fugitive dust from stockpiles. The extent of average annual coal dust deposition was modeled and mapped (Chapter 5, Section 5.7, Coal Dust, Figure 5.7-3). Coal dust is anticipated to deposit a maximum of 1.88 grams per square meter per year (g/m^2/year) adjacent to the project area. This area extends past the project area into the Columbia River. The spatial extent of the maximum annual coal dust deposition near the project area is shown in Figure 5.7-3 in Chapter 5, Section 5.7, Coal Dust.[134]

In assessing the terminal's impacts on water quality and aquatic life, the DEIS relies on the 1.88 g/m^2/year estimate. For the reasons stated in Section VI, the DEIS utilizes a model that underestimates the amount of fugitive coal dust and, therefore, renders the 1.88 g/m^2/year estimate flawed. The Co-leads must revise the DEIS to account for accurate estimate of fugitive coal dust entering the Columbia River, and the associated impacts of that estimate on water quality and aquatic life.

Coal handling terminals around the country and abroad utilize BMPs and, nonetheless, release considerable amounts of fugitive coal dust.[135] The DEIS provides a laundry list of BMPs and design features to address fugitive coal dust. For example, the DEIS states that MBT will control fugitive coal dust from 75-acres of unenclosed coal stockpiles. The DEIS states:

> The coal export terminal would employ dust suppression systems throughout the terminal, including the tandem rotary dumpers, all conveyors, stockpile pads, surge binds, transfer towers, and trestle. The dust suppression system would employ sprayers, sprinklers and foggers that disperse water and capture coal dust.[136]

The DEIS fails to evaluate the effectiveness of these BMPs and design features based on real-world applications, including varying temperature and wind conditions.

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[134] DEIS at 4.5-23.
[135] Ex. 42; Ex. 43 (Sightline Institute, Are Coal Export Terminals Good Neighbors? A closer look at coal dust (Mar. 15, 2011)).
[136] DEIS at 4.5-24.

In addition to 75-acres of unenclosed coal piles, MBT proposes enclosing only 4,900 linear feet of the 16,100 linear feet of conveyor belts. The DEIS fails to address BMPs, if any, to reduce fugitive coal dust from unenclosed conveyor belts.

2. The DEIS ignores studies showing impacts from coal dust on aquatic life.

The DEIS understates the impacts of coal dust on Columbia River water quality and aquatic life. As an initial matter, the DEIS acknowledges studies demonstrating significant impacts from coal and coal dust on marine and estuarine environments.[137] The DEIS states:

> At sufficient quantities, coal and coal dust in marine and estuarine environments have similar adverse effects as elevated levels of suspended sediments on water quality (Ahrens and Morrisey 2005). During periods of lower flow, a smaller amount of coal dust could have a greater impact on water quality. Impacts include increased turbidity, which can interfere with photosynthesis and increase water temperatures (Ahrens and Morrisey 2005). Coal and coal dust in the water column can also affect marine organisms through abrasion of tissue and smothering and clogging of respiratory and feeding organs (Ahrens and Morrisey 2005).[138]

As noted above, the DEIS relies on a flawed model to project coal dust concentrations in the Columbia River at the terminal site and downstream. Based on this flawed model, the DEIS concludes that MBT would not result in significant impacts to aquatic life and water quality. The Co-leads should revise the DEIS to account for the impacts of fugitive coal dust based on deposition levels described in the Coalition's expert report.

In addition, the DEIS fails to address studies conducted over an eleven year period, from 2005 to 2016, documenting the impacts of coal dust in aquatic environments. The DEIS analyzes coal dust studies in Section 3.1.1, Aquatic Impacts, of *SEPA Coal Technical Report: Coal Dust Emissions, Coal Spills Analysis, and Sulfur Dioxide and Mercury Emissions Analysis* (hereafter "Coal Dust Technical Report"). The DEIS Coal Dust Technical Report states:

> The most comprehensive literature review on the potential impacts of unburnt coal in the aquatic environment was conducted by Ahrens and Morrisey (2005). Their review summarized the potential physical and chemical (toxicity) effects of unburnt coal released into the aquatic environment; the following summarizes these effects and draws heavily from their review.

The DEIS relies on Coal Dust Technical Report in describing the impacts of coal dust on water quality and aquatic life. Both the DEIS and the Coal Dust Technical Report fail to examine

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[137] *See* SEPA Coal Technical Report at 44–45.
[138] DEIS at 4.5-23.

studies published after 2005 (*i.e.,* studies released after the Ahrens and Morrisey literature review).[139] For example, the DEIS fails to examine the following studies and reports:

- Harper, Matthew P. and Peckarsky, Barbara L., *Effects of Pulsed and Pressed Disturbances on the Benthic Invertebrate Community Following a Coal Spill in a Small Stream in Northeastern USA*, 544 Hydrobiologia (2005) (Exhibit 44);

- Johnson, Ryan and Bustin, R.M., *Coal dust dispersal around a marine coal terminal (1977-1999), British Columbia: The fate of coal dust in the marine environment*, 68 International Journal of Coal Geology (2006) (Exhibit 40);

- Cabon, Jean Yves, et al., *Study of Trace Metal Leaching From Coals Into Seawater*, 69 Chemosphere (2007) (Exhibit 45);

- Lucas, Steven Andrew, Planner, John, *Grounded or Submerged Bulk Carrier: The Potential for Leaching of Coal Trace Elements to Seawater*, 64 Marine Pollution Bulletin (2012) (Exhibit 46);

- Naidoo, G. and Y. Naidoo. Coal dust pollution effects on wetland tree species in Richards Bay, South Africa, *Wetlands Ecology and Management* (2005) 13: 509–515;

- Meador, J. P.; Sommers, F. C.; Ylitalo, G. M. & Sloan, C. A. (2006, October). Altered growth and related physiological responses in juvenile Chinook salmon (Oncorynchus tshawytscha) from dietary exposure to polycyclic aromatic hydrocarbons (PAHs) *Canadian Journal of Fisheries and Aquatic Sciences,* 63: 2364-2376 (Exhibit 48); and

- Achten, C. and Hoffman, T., *Native polycyclic aromatic hydrocarbons (PAH) in coals – a hardly recognized source of environmental contamination*, 407 Science of the Total Environment 8 (2009) (Exhibit 49).

The Co-leads ignore studies published after 2005, including examples provided above, documenting the impacts of coal dust on aquatic environments. This renders the DEIS's conclusion on coal dust impacts arbitrary.

The DEIS also understates the toxic impacts of coal dust. The DEIS states, "One review of the chemical composition of coal dust (U.S. Geological Survey 2007) suggests that the risk of exposure to concentrations in toxic materials (e.g., PAHs and trace metals) from coal are low because the concentrations are low and the chemicals bound to coal and not easily leached." The DEIS fails to address other studies identifying risks from

[139] The DEIS examines one report on coal spillage published in 2015. That report does not address coal dust.

toxic materials in coal dust. The Co-leads should evaluate the expert report prepared by Leyda Consulting, Inc., on the proposed Morrow Pacific coal export project (hereafter "Leyda Report").[140] The Leyda Report includes an in-depth toxicology report on coal dust.

The FEIS should also incorporate findings from a study on the impacts of coal dust in the marine environment, *Simulated coal spill causes mortality and growth inhibition in tropical marine organisms*, published on May 13, 2016.[141] This is the first study to examine the effects of fine coal particles on tropical marine organisms. The study "demonstrates that moderate to high levels of coal contamination can substantially decrease growth and increase mortality of important reef-bearing coral species, reef fish and seagrass."[142] The Co-leads should analyze the potential for analogous impacts from coal dust on Columbia River aquatic life.

J. Conclusion for Columbia River Impacts.

Federal and state agencies, along with Columbia River Treaty Tribes, have spent decades trying to protect and recover salmon and other species in the Columbia River that are threatened with extinction due to hydropower operations and habitat loss. Indeed, the federal government's chief response to mortality to salmon caused by dams is to improve habitat in the Columbia River estuary. Agreements with the states call for spending tens of millions of dollars on estuary habitat restoration to mitigate hydropower impacts.[143] These efforts will be undermined by the extensive pollution, habitat loss, and risk of accident that are associated with this project. The impacts disclosed in the DEIS and the lack of adequate mitigation support denying permits, including the 401 water quality certification and Shoreline Substantial Development Permit, based on the project's impacts.

VII. THE DEIS UNDERSTATES THE IMPACTS AND RISKS TO PUBLIC HEALTH AND ENVIRONMENTAL JUSTICE COMMUNITIES; AN HIA IS REQUIRED

The Coalition herein incorporates by reference the separate comments filed by Oregon and Washington Physicians for Social Responsibility regarding the significant public health impacts of this project, and the need for a full Health Impact Assessment ("HIA").

The DEIS examines air quality, water quality, traffic delays, noise and light pollution and confirms some serious health impacts but it is also incomplete. The Draft EIS does not incorporate an HIA. Many organizations, municipalities and individuals submitted scoping comments that called for an HIA. They include, but are not limited to, the City of Portland, the City of Mosier, the City of Milwaukee, the City of Beaverton, the City of Eugene, the Oregon

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[140] Ex. 50 (Leyda Consulting, Inc., *Ecological Impacts of Proposed Coal Shipping on the Columbia River Port of Morrow and Port Westward, OR* (2012)).
[141] Ex. 20.
[142] *Id.* at 5.
[143] Ex. 51.

Environmental Justice Task Force, Oregon Physicians for Social Responsibility, Dr. Frank James, and The Yakama Nation.

Because this would be the largest coal export facility in the US, one with a variety of human-heath related impacts, it is imperative that a HIA that closely analyzes all these risks is produced. This HIA must be a state-of-the art assessment that takes a comprehensive approach to health and health care costs, while incorporating the values of equity, environmental justice, democracy, sustainable development, and ethical use of evidence. The HIA should answer specific health and safety questions submitted during scoping process for the EIS by individuals and organizations. The HIA should also utilize the full resources available to Co-leads via EPA's EJ Screen.

It is incumbent upon the decision makers in this process to apply the *best available science* in determining the health impacts of the MBT. 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 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 MBT.

The highest exposure risks of diesel particulate matter (DPM) from the MBT will occur to populations in close proximity to the tracks, the terminal, and shipping lanes. Thus, we recommend that the HIA quantify near source health effects spatially along transportation corridors, not just for the terminal site. This should include all railway corridors and vessel corridors.

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 independent consultants familiar with the models and with interpreting the results of the models.

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.

The HIA should analyze the negative air quality and health impacts from three and four locomotives powering each coal train. To the extent that the DEIS predicts DPM levels and other dangerous pollutant levels on the assumption that there will only be two locomotives powering each train, the Final EIS and HIA should correct this assumption and all related estimates.

If mitigation measures such as construction of a terminal building that encloses piles of coal, covered rail cars that enclose coal, other 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 Final EIS.

Finally, the HIA is an important tool for decision makers and must be made available so the public can review and comment on it. Scoping for HIA was not completed during the DEIS comment period. The public must be provided the opportunity to comment on a draft HIA before a Final HIA and a Final EIS is released.

The Coalition also incorporates by reference the comments regarding environmental justice analysis filed by Stand. We are dismayed that the DEIS limited analysis of environmental justice impacts to the project site only, whereas there is abundant evidence of noise, air pollution and other impacts to environmental justice impacts all along the rail-line. It is critical that these communities and individuals, who frequently lack English language skills and/or face challenges that prevent them from participating in the EIS process, are engaged in the decisionmaking process. They will bear the burdens of this project in increased noise, pollution, and emergency risks, but will receive none of the claimed benefits. The DEIS falls short in this regard.

VIII. THE DEIS UNDERSTATES THE IMPACTS AND RISKS OF AIR POLLUTION

A. The DEIS Relies Excessively on NAAQS Compliance, Which Does Not Prevent Significant Environmental and Health Harms

The computer modeling used in support of the DEIS reveals that people at and near the Terminal will be exposed to air pollution levels which can cause a variety of health problems, including asthma attacks and premature mortality.[144] However, the DEIS fails to warm people of this potentially deadly impact, including the more than 600,000 people in Washington with asthma.[145] The DEIS inappropriately relies on national ambient air quality standards ("NAAQS") to judge whether there is significant impact. Use of the NAAQS in this context is arbitrary and unlawful because NAAQS reflects policy judgments aimed towards effective implementation of the Clean Air Act which are wholly irrelevant to determining if there will be

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[144] The DEIS itself and the SEPA Air Quality Technical Report are largely based on an analysis using a computer model to predict air pollution levels. The analysis was done using the AERMOD computer modeling system. Despite the AERMOD analysis being the heart of the air quality analysis, the Department of Ecology and Cowlitz County did not make the AERMOD files available to the public. This created a highly non-transparent process. Sierra Club submitted a public information request for the AERMOD modeling files and other documents used to prepare inputs into the AERMOD modeling files. Cowlitz County and the Department of Ecology eventually provided these modeling files to Sierra Club but not until June 1, 2016. Thus, Sierra Club only really had a 13-day public comment period with regard to the air quality issue which is a technical, time-consuming issue. Such a short comment period on such a technical issue is inconsistent with SEPA.

[145] *See* http://www.doh.wa.gov/DataandStatisticalReports/DiseasesandChronicConditions/AsthmaData (according to Washington State Department of Health, over 600,000 in Washington have asthma, nearly 120,000 of these are children and nearly 100 people die each year from asthma).

significant environmental impacts from construction and operation of the Terminal. In other words, air quality impacts can still be "significant" even if a violation of NAAQS does not occur.

Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing SEPA.[146] Scientific analysis is by definition, something different than policy judgments designed to lead to effective implementation of the Clean Air Act, a regulatory program not at issue in the DEIS. SEPA itself makes clear what should be obvious, that policy judgments to ensure effective implementation of the Clean Air Act are not relevant to an EIS. Rather, SEPA explains that significance means a "reasonable likelihood of more than a moderate adverse impact on environmental quality."[147] It should be beyond dispute that premature death or asthma attacks are a "more than a moderate adverse impact".

The DEIS says:

> Computer modeling determined the maximum annual construction emission estimates for the peak construction year would not exceed federal air quality standards. This means that although emissions of criteria air pollutants would occur, they would not be expected to cause a significant change in air quality and are unlikely to significantly affect sensitive receptors surrounding the project area.[148]

The DEIS at 5.7-10 also claims:

> PM10 and PM2.5 have been determined to cause increased health hazard if the regulatory limits are exceeded (U.S. Environmental Protection Agency 2014c). If any pollutant level exceeds regulatory limits, health impacts would depend on the concentration in the air, the duration of the exposure, and the number of times exposure occurs.) 5.7-25 (Overall, the impacts of PM10 and PM2.5 emissions from Proposed Action-related rail transport of coal would not be significant because emissions would be below applicable federal standards.)

It is simply a false statement to claim that there are no health hazards for PM10 and PM2.5 below the regulatory limits, that is the NAAQS. The DEIS cannot actively mislead the public about the Terminal's impacts.

Comparing the modeled impacts to the national ambient air quality standards (NAAQS) is not appropriate in the context of NEPA/SEPA. This is because the NAAQS is not a concentration of pollution below which people are not harmed. Rather, NAAQS represent policy

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[146] 40 C.F.R. § 1500.1(b).
[147] WAC 197-11-794.
[148] DEIS at S-34. *See also* 5.6-10 (same).

judgments made in the context of the effective implementation of the Clean Air Act. However, in the context of NEPA/SEPA, the relevant question is environmental and public health impacts.[149]

NAAQS consists of four elements: indicator, averaging time, form and level.[150] For example, the 2010 SO_2 NAAQS has a level of 75 parts per billion (ppb) and an averaging time of one-hour. EPA selected this level and averaging time of 75 ppb based on a one-hour averaging time based on the overwhelming scientific conclusion that certain people, like asthmatics, will be hurt if they are exposed to SO_2 at 75 ppb, even for periods as short as five minutes.[151]

However, the 2010 SO_2 NAAQS also has a form. The form is the 3-year average of the 99% of the one-hour daily maximum SO_2 value. But there is not scientific evidence that people do not experience adverse impacts until they are in their third year of exposure to SO_2, for example.

Similarly, the use of the one-hour daily maximum value is relevant to the NAAQS but hides significant adverse environmental impacts in the context of an EIS. For example, say there was a 1-hour average of 85 ppb at 8 am and a 1-hour average of 84 ppb at 6 pm on the same day at the Terminal. The 2010 SO_2 NAAQS wholly ignores the 84 ppb level at 6 pm because the 2010 SO_2 NAAQS only considers the highest 1-hour concentration in a day. However, in terms of scientific analysis, the 84 ppb level at 6 pm is highly relevant and must be disclosed. This is because the 84 ppb is at a level that the science upon which EPA relied to set the level of the NAAQS shows there to be adverse impacts such as asthma attacks. And the individual people at or near the Terminal at 6 pm are likely to be different than the individual people at or near the Terminal at 8 am. Exposing more people to dangerous levels of air pollution makes the impact more significant. Ignoring this increased impact is contrary to SEPA but by relying on the 2010 SO_2 NAAQS including all four of its elements, rather than just the purely science based ones like level and averaging time, that is exactly what the DEIS does.

The form of the 2010 SO_2 NAAQS represents policy judgments about how to effectively implement the Clean Air Act. A three-year average of the 99th percentile of the one-hour daily maximum SO_2 concentration is used because using a standard based on only one year of data and based on the highest concentrations would result in areas "bouncing" back and forth between nonattainment and attainment designations under the Clean Air Act's implementation provisions. EPA refers to this as the "stability" of the standard. EPA chose the form of the NAAQS because it would be "appreciably more stable" than other forms.[152] This is also true for the form of the PM10, PM2.5, NO_2 and ozone NAAQS.

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[149] WAC 197-11-794; 40 C.F.R. § 1500.1(b).
[150] 75 Fed. Reg. 35,520, 35,529 (June 22, 2010).
[151] 75 Fed. Reg. at 35,537 – 35,539.
[152] 75 Fed. Reg. at 35,541.

The level of 75 ppb, however, was set based primarily on the controlled human exposure and epidemiological evidence.[153] That said, it is important to note that the level is also a public health policy judgment.[154] That is, EPA did not say that exposures below the level of 75 ppb will not cause adverse impacts. In fact, EPA said there were epidemiological studies which showed associations between SO_2 concentrations and emergency department visits and hospital admissions down to the 50 ppb level.[155] EPA was willing to accept those possible adverse impacts below 75 ppb as a policy judgment. The DEIS fails to disclose this information. Rather, it misleads people into thinking exposures below the NAAQS will not have adverse impacts when the scientific evidence, as acknowledged by EPA, says otherwise.

It was the EPA Administrator's policy judgment at the time of creating this NAAQS that the form of the NAAQS would result in effective implementation of the Clean Air Act. We are not questioning this policy judgment or suggesting that the EIS somehow question the EPA's Clean Air Act policy judgment. However, the science of environmental impacts, which is distinct from the policy of Clean Air Act implementation, should be the basis for an EIS. The science says that short term exposures of 75 ppb or above can cause injury to people. Policy judgments about proper implementation of the Clean Air Act should not skew the scientific analysis of an EIS. Thus, the DEIS should evaluate whether there will be short-term impacts, that is 5 minutes or greater, of 75 ppb or above SO_2.

Using the appropriate standard for an EIS, that is the level and averaging time from a NAAQS, and accepting the DEIS' modeling as accurate despite all the flaws in the DEIS' modeling described below, we see that the Terminal will cause air pollution levels which would constitute significant environmental and public health impacts. For example, for SO_2, the 75 ppb level is equivalent of 196 ug/m^3.[156] The DEIS' modeling found that three year average of the highest 1-hour SO_2 concentration was 292.2 ug/m^3.[157] This is significantly above the NAAQS level of 196 ug/m^3. And there are multiple exceedances of the NAAQS level at multiple locations.[158] We only see ten concentrations above the NAAQS level in the modeling files but the lowest one is 237.6 ug/m^3 so we assume there are many others. The DEIS fails to disclosure that the public will be exposed to SO_2 levels that can trigger asthma attacks and cause other adverse health impacts including premature mortality.

As to PM2.5, Longview has a maximum PM2.5 24 hour level of 38.9 ug/m^3 in 2015 even without the Terminal.[159] Thus, Longview already has PM2.5 levels that are dangerous so the additional PM2.5 pollution, even if we assume the DEIS' modeling is correct, will result in PM2.5 levels of at least 50.9 which is well above the 2006 PM2.5 NAAQS level. Again, the DEIS fails to disclose these significant environmental impacts. Similarly the DEIS evaluates

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[153] 75 Fed. Reg. at 35,546.
[154] *Id.*
[155] 75 Fed. Reg. at 35,547.
[156] SEPA Air Quality Technical Report (Air Report) at 3-8, Table 9.
[157] Air Ex. 1 at Page 201 (Group ID "All").
[158] *Id.*
[159] Air Ex. 2.

Spokane for coal dust from trains. Spokane already has PM2.5 levels above the NAAQS level of 35 ug/m^3.[160] The addition of the fugitive coal from the coal trains will result in Spokane experiencing PM2.5 above the 24 hour NAAQS levels but the DEIS fails to disclose this adverse impact caused by the fact that there are modeled concentrations above the NAAQS level even if there are not modeled concentrations above the NAAQS form.

B. The DEIS Does not Disclose that Air Pollution Levels will Exceed NAAQS During Operations If One Examines Air Pollution Levels On-Site and Over the Columbia River

Even if one accepts the NAAQS as an appropriate standard to judge significant impacts for an EIS, which we do not, the Terminal will still cause violations of the NAAQS. However, the DEIS failed to reveal this critical impact.

The DEIS' modeling analysis simply omits any modeling of air pollution levels on the site of the facility as well as on nearby parts of the Columbia River.[161] The DEIS did not place receptors in its model on the site of the Terminal as well as on parts of the Columbia River. With no receptors in the model at these locations, the only possible result is that air pollution concentrations in these locations are zero. This means the DEIS ignores air pollution impacts to workers at the Terminal, including people like the locomotive engineers who will not be employees of MBT.[162]

We had a modeler with extensive expertise in AERMOD fill in this important blank. Lindsey Sears re-ran the modeling that ICF did for the DEIS exactly the same except filling in the receptor grid included the facility and the Columbia River.[163] The results as reported in Table 1 below show that the Terminal will violate the PM10 24-hour, the PM2.5 24-hour and the SO_2 1-hour NAAQS.[164] The PM10 level is over twice the NAAQS. The PM2.5 level is nearly twice the NAAQS and the SO_2 level are over 25% above the NAAQS. These are significant environmental and worker safety impacts which the EIS must disclose.

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[160] Air Ex. 3 at 2.
[161] Air Ex. 4 at 1 and Figure 1. We have included Ms. Sears modeling files as Ex. 5 to provide complete transparency.
[162] ICF may have taken this approach because of the Clean Air Act regulatory definition of ambient air which allows permittees in the Clean Air Act context to ignore ambient air quality impacts on the permittees' private property if non-employees are physically prohibited from entering the area. This Clean Air Act regulatory definition has no place in the context of an environmental impact statement which is supposed to reveal all of the project's impacts. Furthermore, even under the Clean Air Act, a permittee is not allowed to exclude consideration of impacts on public areas such as the Columbia River but that is exactly what ICF did. *See* Air Ex. 4 at Figure 1. In addition, a Clean Air Act permittee would be required to include receptors on the rail tracks on site because non-permittee employees will be on the trains.
[163] Air Ex. 4 at 1-2 and Figure 2.
[164] Air Ex. 4 at Table 1.

Table 1: AERMOD Results for Onsite and Offsite Sources, with Onsite Receptors

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	1-hour	117	57	174	188
PM_{10}	24-hour	309	23	332	150
$PM_{2.5}$	24-hour	45	18	63	35
SO_2	1-hour	232	15	246	196

C. Construction Emissions Will Violate NAAQS

The SEPA Air Quality Technical Report reveals that the ICF modeling analysis failed to consider fugitive PM10 and PM2.5 emissions from roads when the trucks run over them.[165] The DEIS states that during peak construction, 56,000 loaded truck trips will occur at the Terminal but does not discuss the huge air pollution impact of fugitive PM from these trucks. Again, we filled in this important aspect of the problem.

First, engineer Dr. Ranajit Sahu calculated the PM10 and PM2.5 emissions from the haul roads.[166] Then modeler Lindsey Sears modeled these emissions using ICF' s own modeling and a complete receptor grid. Ms. Sears conservatively assumes that MBT reduces fugitive emissions from the roads by 75% through various controls measures even though there is absolutely no reason to believe this will actually happen. Even with this very conservative assumption, the modeling showed violations of both the PM10 and PM2.5 24-hour NAAQS.[167] This is a very significant environmental impact which must be disclosed in the EIS.

D. The Terminal Will have a Significant Impact on Deadly PM2.5 Levels

There is no known level of PM2.5 below which death and disease do not occur. *See North Carolina v. TVA*, 593 F.Supp.2d 812, 822 (W.D.N.C. 2009) *rev'd on other grounds*, 615 F.3d 291 (4th Cir. 2010) ("there is an increased risk of incidences of premature mortality in the general public associated with $PM_{2.5}$ exposure, even for levels at or below the NAAQS standard of 15 [u]g/m ^{3}."); *Sierra Club v. TVA*, 592 F.Supp.2d 1357, 1371 (N.D. Al. 2009) ("there is no level of primary particulate matter concentration at which it can be determined that no adverse health effects occur."); *Catawba County v. EPA*, 571 F.3d 20, 26 (D.C. Cir. 2009) ("A 'significant association' links elevated levels of PM2.5 with adverse human health consequences such as premature death, lung and cardiovascular disease, and asthma….PM2.5 can travel

[165] DEIS at 5.6-5, 5.6-11.
[166] Air Ex. 4 at 2.
[167] Air Ex. 4 at Table 2.

hundreds or thousands of miles."); 70 Fed. Reg. 65,983, 65,988 (Nov. 1, 2005) ("emissions reductions resulting in reduced concentrations below the level of the standards may continue to provide additional health benefits to the local population."); 71 Fed. Reg. 2620, 2635 (Jan. 17, 2006) (US EPA unable to find evidence supporting the selection of a threshold level of $PM_{2.5}$ under which the death and disease associated with $PM_{2.5}$ would not occur at the population level). Gina McCarthy, the head of EPA, in a letter to Hon. Fred Upton, U.S. House of Representatives (Feb. 3, 2012) stated as follows:

> Studies demonstrate an association between premature mortality and fine particle pollution at the lowest levels measured in the relevant studies, levels that are significantly below the NAAQS for fine particles. These studies have not observed a level at which premature mortality effects do not occur. The best scientific evidence, confirmed by independent, Congressionally-mandated expert panels, is that there is no threshold level of fine particle pollution below which health risk reductions are not achieved by reduced exposure. Thus, based on specific advice from scientific peer-review, we project benefits from reducing fine particle pollution below the level of the NAAQS and below the lowest levels measured in the studies.

The Air Quality Technical Report states that "the state's goal [is] to keep PM2.5 concentrations below 20 ug/m^3."[168] However, the DEIS itself hides this goal of keeping PM2.5 below 20 ug/m^3 and instead only relies on the 2006 PM2.5 NAAQS of 35 ug/m^3. Failure to mention the state's goal of keeping PM2.5 below 20 ug/m^3 is a critical omission. This is because the DEIS states that background at the Terminal of PM2.5 is 17.8 ug/m^3.[169] However, the operations of the coal export terminal will add 4.8 ug/m^3, according to the DEIS's modeling exercise, which puts PM2.5 over this important threshold. Moreover, that modeling omits key sources of emissions discussed elsewhere in these comments. Even with its underestimation of impacts, the total predicted concentration will be 22.6 ug/m^3.[170] Thus, the operations of the coal export terminal will push the PM2.5 levels above the state's goal. This is a significant impact that the Final EIS must reveal. Mandatory mitigation in terms of hourly throughput limits and limits on simultaneous operation of different processes must be imposed to bring the total PM2.5 levels back to below the state's goal of 20 ug/m^3.

E. <u>The Terminal May Force Parts of Washington State into a Non-Attainment Designation for Ozone</u>

The project may force the Seattle region into an ozone nonattainment designation will all the consequences that flow from that, such as increased vehicle testing and the potential loss of highway funds. The Air Quality Technical Report acknowledges that the ozone monitor near

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[168] Air Report at 2-10.
[169] DEIS at 5.6-14.
[170] *Id.*

Enumclaw, which is in the same county at Seattle, by which the coal trains will pass, has shown exceedances of the 8-hour ozone standard during the past 3 years.[171] However, the Technical Report does not reveal the disturbing trend in ozone levels. As Table 2 shows, between 2013 and 2015, the ozone levels at this site have increased almost 30% and the most recent year, 2015, has a 4th high value that is above the 2015 ozone NAAQS level of 70 parts per billion. Adding all the additional ozone precursor pollution from all the coal trains will very likely push this monitor over the edge into nonattainment status.

TABLE 2

	2013	2014	2015
4th High 8-hour daily max	57	67	74

Washington does not currently have any ozone nonattainment areas. In fact, it has been over a quarter century since Washington has had an ozone nonattainment area. The EIS must reveal the potential impact of Washington having an ozone nonattainment area.

F. <u>The OLM Method Was Not Properly Implemented</u>

In determining impacts of nitrogen dioxide (NO_2), the DEIS uses a three tier approach. For Tier 3, the DEIS uses the ozone limiting method (OLM). However, the DEIS did not properly apply the OLM.

The DEIS uses an ozone background of 42 ppb for every hour in its OLM.[172] However, ozone levels fluctuate hourly. Thus, the OLM calls for actually hourly ozone levels to be used. OLM "require[s] …a background ozone monitor for use in the NO titration schemes."[173]

A single representative background ozone concentration can be used, according to EPA guidance, but the user must demonstrate that the single representative background ozone concentration is conservative for each hour of modeling.[174] In other words, the user would have to show that in no hour out of the whole modeling exercise, in this case three years of modeling, did the ozone levels exceed 42 ppb. The DEIS does not attempt to do this.

"Furthermore, hourly monitored ozone concentrations used with the OLM and PVMRM options must be concurrent with the meteorological data period used in the modeling analysis[.]"[175] Here, the meteorological data period is 2001-2003 but the ozone concentrations are not from 2001-2003. Thus, the Tier 3 OLM must be redone using hourly ozone values from 2001-2003.

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[171] Air Quality Technical Report at 2-10.
[172] Air Report at 3-6, ftnt. f, 3-8, ftnt. e.
[173] https://www3.epa.gov/scram001/guidance/clarification/NO2_Clarification_Memo-20140930.pdf at 11.
[174] *See* Air Ex. 6 at 8.
[175] Air Ex. 6 at 8.

G. The DEIS Significantly Underestimates SO^2 Emissions.

The DEIS is based on an assumption that locomotives and tug boats will use diesel fuel that contains 15 parts per million (ppm) sulfur.[176] However, EPA's regulations allow the use of 500 ppm sulfur fuel in a certain type of diesel which is referred to as diesel transmix.[177] While diesel transmix is not a "common" fuel, nothing prevents it from being used. The SO_2 NAAQS is based on a one-hour averaging time. The form on the 99% percentile of the 1-hour daily maximum concentration. That means that just four hours per year, or 0.04% of the time, high SO2 concentration need to be present to cause a SO2 NAAQS violation. Thus, the diesel burning pollution sources at the Terminal could use 15 ppm sulfur diesel the vast majority of the time, use 500 ppm sulfur diesel relatively rarely and still create a significant impact when it comes to SO2.

Moreover the science behind the SO_2 NAAQS is based on impacts from as little as a five minute exposure.[178] Thus, even if diesel transmix is used around four one-hundredths of a percent of the time, it could results in SO_2 concentrations that are significant enough to cause asthma attacks. That is, it could result in concentrations which could trigger asthma attacks in workers, visitors and recreationalists. The EIS needs to reveal this impact to the public.

H. The DEIS Ignores Acid Deposition

Nitrogen and sulfur deposition into river and wetlands can have significant impacts on fish and water quality. Climate change can make this worse by decreasing the amount of water in the river thus increasing the impacts of the nitrogen and sulfur deposition. The DEIS failed to consider acid deposition in the tribal resources section as well as the air quality section.[179] The DEIS also failed to consider acid deposition in the surface water and wetlands section and the water quality and fish sections.[180]

The final EIS analysis must consider acid deposition into waterways from the trains' and ships' diesel engines, emergency diesel engines and diesel fire water pumps. These local impacts should be considered in the context of global acidification of the oceans. We raised this issue in our scoping comments.[181] We do not know why this important aspect of the problem continues to be ignored.

I. The DEIS Fails to Consider Ozone Impacts from Mining the Uinta Basin

The DEIS reveals that some of the coal shipped through the Terminal could be mined in

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[176] DEIS at 5.6-7.
[177] *See* Air Ex. 7
[178] 75 Fed. Reg. at 35,524.
[179] DEIS at S-17.
[180] DEIS at S-20 - S-23, S-25 - S-26.
[181] DEIS Appendix J: Scoping Summary Report at 5-11, 5-12.

the Uinta Basin.[182] The Uinta Basin is a geologic basin that includes much of the northeastern corner of Utah, extending into northwestern Colorado. As we have previously discussed, mining-related impacts have been erroneously omitted from consideration in this DEIS.

The Uinta Basin has some of the worst ozone in the country. While ozone was long thought to be primarily an urban problem, recently EPA has acknowledged severe wintertime ozone violations in rural areas with significant extractive industries, such as the Uinta Basin and the Upper Green River Basin in Wyoming.[183] In the Uinta Basin, NOx and VOC emissions are trapped near the ground by stagnant air and converted to ozone by intense sunlight reflecting off snow. When these conditions occur, these areas experience ozone levels exceeding those of the most heavily populated American cities. For example, in 2010 and 2011, Uintah County's ozone levels exceeded Los Angeles County's worst ozone days.

In 2007, EPA brought a Clean Air Act enforcement action against Kerr-McGee. EPA and Kerr-McGee settled through a consent decree, which required Kerr-McGee to fund, install, and operate ambient air quality monitors in the Uinta Basin to monitor ozone and other pollutants. The two monitors are known as the Redwash and Ouray monitors. Private monitoring is not subject to EPA's regulations governing state monitoring networks found at 40 C.F.R. Part 58. But the consent decrees mandate that the two monitors "shall meet the siting, methodology and operation requirements of 40 C.F.R. Part 58." Accordingly, the private companies were required to use EPA-approved measurement technologies and locate the monitors at certain elevations, in the path of the predominant wind direction, and away from obstructions like buildings. *See* 40 C.F.R. § 58, Apps. C, E. The monitors were installed in two widely-separated areas within the heart of the Uinta Basin, at locations approved by EPA.

Since 2009, the Redwash and Ouray monitors have measured numerous, significant exceedances of the 2008 ozone standard of 0.075 ppm and the 2015 ozone standard of 0.070 ppm. In 2010, the Redwash and Ouray monitors each measured more than 30 exceedances (that is, individual instances when the eight-hour ozone levels exceeded the 2008 standard). In 2011, the monitors each measured more than 20 exceedances, and the Ouray monitor recorded an eight-hour concentration of 0.139 ppm—nearly twice the federal standard. The design value for the Redwash monitor between 2009 and 2011 was 0.088 ppm and for the Ouray monitor was 0.100 ppm, both of which violate the 0.075 ppm standard by wide margins. According to EPA, "it is clear that the measured values are a concern for public health."

The Terminal is intended to increase the market for coal being mined from the Uinta Basin. Yet, the DEIS wholly ignores the impacts that increased coal mining in the Uinta Basin will have on the Basin's already significant ozone problem.

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[182] DEIS at S-1.
[183] *See* 77 Fed. Reg. 30, 088, 30,089 (May 21, 2012).

J. Failure to Consider Air Pollution Impact to Historic Properties

The DEIS acknowledges that air pollution can harm structures.[184] "Coal dust can also cause nuisance impacts, such as affecting the look or cleanliness of something when it is deposited on surfaces."[185] Yet, the DEIS fails to analyze this important aspect of the problem.[186]

In addition to considering impacts to historic properties and tribal resources within the footprint of the export terminal, the EIS and National Historic Preservation Act (NHPA) analysis must consider impacts from air pollution. The impacts can come in a variety of ways. Fugitive coal particulate matter from the mining, transportation, loading and unloading of the coal can cause the soiling and darkening of historic properties. In addition, acid deposition from diesel engine emissions and blasting may damage historic properties and tribal resources like fish.

Several studies could inform this analysis. One of the first studies to look comprehensively at the synergistic effects of various air pollutants on culturally-significant structures, the MULIT-ASSESS study, which developed multi-pollutant deterioration and soiling models of wet and dry deposition of gases and particulates on materials.[187] More recently, the CULTSTRAT study researched threshold levels of pollution for different materials used in historic structures.[188] The book *The Effects of Air Pollution on Cultural Heritage* may also serve as a useful resource in this evaluation. We raised this in our scoping comments.[189] We do not know why this important aspect of the problem continues to be ignored.

K. The NAAQS Analysis Must Include Nearby Sources, the Proposed Source, and Background.

The DEIS claims that:

> The air quality modeling method followed general EPA protocols used in air quality permitting. Representative background concentrations for the study area (Northwest International Air Quality Environmental Science and Technology Consortium 2015)

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[184] DEIS at Air Quality Fact Sheet, DEIS at 5.6-1.
[185] Coal Dust Fact Sheet at page 1.
[186] DEIS at S-16.
[187] Dr. Vladimir Kucera, Swedish Corrosion Institute (SCI), *Deliverable 0.2, Publishable Final report, Model for multi-pollutant impact and assessment of threshold levels for cultural heritage,* Project period 1 January 2002 to 30 April 2005. *Available at* http://www.corrinstitute.se/MULTI-ASSESS/web/page.aspx?pageid=59189.
[188] Dr. Vladimir Kucera, Swedish Corrosion Institute (SCI), *CULT-STRAT Assessment of Air Pollution Effects on Cultural Heritage—Management Strategies Specific Targeted Research Project (STREP) Priority 8.1 Policy-oriented Research Publishable Final Activity Report,* and *Deliverable 17 CULTSTRAT Verified indicators and threshold levels for cultural heritage,* public policy that protected historic structures.
[189] DEIS Appendix J at 5-25.

> were used to determine background concentrations in air quality analyses since no representative monitoring data are available.
>
> …
>
> To assess impacts associated with the Proposed Action, the model was used to predict the increase in criteria air pollutant concentrations. The model's maximum incremental increases for each pollutant and averaging time were added to applicable background concentrations. The resulting total pollutant concentrations were then compared with the appropriate NAAQS.[190]

Yet a fundamental of air quality modeling for air permitting is that the proposed source's impacts are added to impacts from nearby sources as well as background values. "EPA requires that, at a minimum, all nearby sources be explicitly modeled as part of the NAAQS analysis."[191] It is only when it is demonstrated that the nearby source was contributing to the background value at the time it was recorded that a nearby source can be excluded.

Yet, the DEIS' analysis wholly ignores nearby sources in its NAAQS analysis. Examples of nearby sources which would need to be included in the EIS' NAAQS analysis include coal hauling trucks from the existing Dock 1 at the Terminal to Weyerhaeuser, the emergency generator at Weyerhaeuser and Weyerhaeuser's coal fired power plant. These are just examples. All existing emission sources within 50 kilometers must be considered for inclusion in the emission inventory for the NAAQS analysis.

L. It is Arbitrary for the DEIS to Use An Ozone Conformity *De Minimis* Level to Determine Significant Impacts for Construction.

The DEIS uses the ozone *de minimis* level for conformity purposes to judge whether all pollutants, including PM2.5 and PM10 which have nothing to do with ozone, will have significant impacts with regard to construction of the Terminal.[192] There are several problems with this standard. To begin with there is no rational reason to use an ozone standard to judge the significance of NOx, SOx, PM2.5 and PM10. Each pollutant has separate impacts at separate levels. In addition, conformity is applicable to nonattainment areas but the DEIS states that the Longview area is an attainment area for all pollutants.

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[190] *See* DEIS at 5.6-6.
[191] US EPA NSR Workshop Manual at C.32 – C.34. The Department of Ecology acknowledges the validity of the NSR Workshop Manual. *See* http://www.ecy.wa.gov/programs/air/psd/psd_FAQS.html
[192] DEIS at 5.6-11.

A rational standard for this purpose would be the PSD "significance" thresholds. These are applicable to attainment areas and are pollutant specific. The PSD significance thresholds are 40 tpy for NOx, 40 tpy for SO_2, 15 tpy for PM10, 10 tpy for PM2.5 and 100 tpy for CO.[193]

The DEIS admits that NOx emissions from barges alone would be 59 tpy of NOx which is above the PSD significance level.[194] Barges plus equipment would be 83.6 tpy of NOx or over twice the significance threshold. Even without barges, the NOx emissions are 38.1 but this does not include an emergency generator and diesel fire water pump which must be routinely operated to ensure readiness for an emergency.

Furthermore, the daily maximum NOx emissions from equipment is 229.6 lb/day.[195] 229.6 lb/day * 5 days per week * 52 weeks per year / 2000 lbs per ton equals 29.85 tons per year. But Table 4 only reports the equipment NOx emissions as 24.60 tpy. This difference of 5.25 tpy would bring the NOx emissions in the study area to 43.35 tons per year which is above the PSD significance threshold. And all of the annual tpy values are incorrect except the barges. They underreport the tons per year compared to the daily values. The DEIS offers no rationale for the incorrect annual values and no rationale for why the barges would operate 5 days a week/52 weeks per year while the other sources would not.

Combustion Sources	TPY based on lb/day in Table 5
Equipment	29.85
Haul Trucks (project area)	7.11
Haul Trucks (study area)	14.36
Barges	59.11
Passenger Commute and Crossing Delay	0.19
Total for Haul Truck Scenario	51.51

Thus, the DEIS should reveal, even accepting the DEIS daily emission estimates, which we do not, that construction will have significant impacts.

M. A Comparison of the DEIS' Predicted PM Fugitive Emissions to Actual PM Emissions at Australian Coal Ports Reveals that the DEIS' Predictions are Unreasonably Low.

The FEIS should also consider evidence from Australia, which has had a long history of large coal-export terminals with open coal stockpiles, and extensive experience with the pollution that they cause. One analysis for a new terminal in Newcastle, performed as part of the project's license, shows that it would discharge over 300,000 kg/year of coal dust at operations

[193] 40 C.F.R. § 52.21(b)(23)(i).
[194] Air Report Appendix A1 Construction Emissions
[195] Technical Report at 3-3.

of 66 million ton/year.[196] The analysis breaks down the emissions rate for each stage of the process. The largest source of emissions is from wind erosion of stockpiles.

Another analysis, based on data from Australia's National Pollutant Inventory [197] — that nation's most authoritative data source for pollutant information—shows that coal terminals were the primary sources of particulate air pollution in two areas where major coal terminals operated.[198] The Hay Point coal terminal in MacKay self-reported a release of 160,000 kg of PM10 and 17,000 kg of PM2.5 in 2014-15.[199] A news report from April of this year reported that the three coal export terminals in Newcastle were responsible for 62% of that city's PM10 air pollution.[200] These authoritative figures collide sharply with the DEIS's modeled emissions—which anticipated releases an order of magnitude lower, using the exact same approaches to reduce dust from open stockpiles. Clearly, the real-world experience in Australia has more to offer than the flawed models of the DEIS.

N. The DEIS Fails to Include Diesel Emergency Generators and Fire Water Pumps.

The DEIS' emission inventory for operations is missing two types of pieces of equipment: diesel emergency generators and diesel fire water pumps. We had an expert engineer, Dr. Ranajit Sahu, give his opinion on the lack of diesel emergency generators and fire water pumps in the DEIS modeling analysis emission inventory. Dr. Sahu concluded that it was an omission to not include diesel emergency generators and fire water pumps.[201] Dr. Sahu explained that diesel-fired emergency generators are ubiquitous at industrial facility in order to provide power to critical loads during power outages.[202] Dr. Sahu explained that these are typically tested weekly, monthly and annually and that the emissions during these tests are usually included in emission inventories used for air permitting and environmental impact assessments.[203] Dr. Sahu explains that similarly, he would expect fire suppression equipment at the Terminal which may actually be required by insurance requirements and the National Fire Protection Code.[204] These sources, with their low stack heights and relatively low exit temperatures and velocities, often play a critical role in ambient pollution levels in modeling analysis. Thus, this is a critical omission.

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[196] Ex. 51.
[197] http://www.npi.gov.au/
[198] Ex. 52.
[199] Ex. 53.
[200] http://www.smh.com.au/environment/air-pollution-increases-69-per-cent-as-coal-named-top-polluter-20160417-go8b82.html
[201] Ex. 8 at ¶6.
[202] *Id.* at ¶7.
[203] *Id.* at ¶7.
[204] *Id.* at ¶8.

The DEIS should not accept any claim by MBT simply at face value. MBT had an unpermitted diesel engine driven generator at its existing facility for almost 5 years.[205] The Department of Ecology should not allow MBT to get away with a similar omission again.[206]

IX. THE CUMULATIVE IMPACTS SECTION UNDERSTATES THE EXTENT OF HARM IMPOSED BY FOSSIL FUEL TRANSPORTATION IN WASHINGTON.

A. SEPA Requires a Robust Analysis of Cumulative Impacts

SEPA requires consideration of cumulative effects. WAC 197-110060(4)(e); WAC 197-11-330(3)(c) ("Several marginal impacts when considered together may result in a significant adverse impact."); *White v. Kitsap Cnty.*, SHB No. 09-019 at 17 (2009) (cumulative impacts of a proposed action together with the impacts of pending and future actions should be considered when making a threshold determination). In *Quinault Indian Nation v. Hoquiam,* the SHB overturned MDNSs for two crude-by-rail facilities explicitly because they failed to consider the cumulative effects of increased rail and marine vessel traffic from each other, and a third crude-by-rail project.[207]

The DEIS does a credible job of including projects that will have major and long lasting impacts to the environment, economy, and quality of life in Washington state.[208] As the DEIS acknowledges, our region is under assault by fossil fuel industries who wish to transform the region into a global hub for the movement of fossil fuels like coal and oil. The cumulative effects section provides a basis to begin to understand the scale of this transformation, and make decisions as to whether this is the future that we collectively envision. For example, the cumulative impact section documents breathtaking increases in rail and vessel traffic in our state—76 additional daily coal, oil and other trains crossing the state, and almost 2,000 additional vessel transits a year in the Columbia. Even with just the material provided in this section, there is a more than adequate basis to reject the terminal and other projects like it. However, for the reasons discussed below, much more is needed. The DEIS's cumulative effect section falls short of fulfilling the Co-leads' obligation to explain just what this transformation means for the people and environment of this region.

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[205] Ex. 9 at 3.

[206] The DEIS at 5.6-16 has footnotes d and e next to the NO_2 1 hour value. DEIS at 5.6-17 does the same thing. These footnotes contradict each other. The Final EIS should just include footnote e unless that is not what they actually used. DEIS 5.7-3 references Appendix L but there is no Appendix L to the DEIS.

[207] *Quinault*, *supra* note 2, at 18 ("agencies are required to consider the effects of a proposal's probable impacts combined with the cumulative impacts from other proposals").

[208] There are additional projects included in the cumulative effects section which, like MBT's, face an uncertain future. For example, the Army Corps has recently denied a key permit for a similar coal facility near Bellingham. However, that decision left open the possibility of altering the project to reduce its impacts. Moreover, its proponents are considering judicial challenges to the Corps' decision, and efforts continue in Congress to override the Corps' discretion in this matter. Until the proponent irrevocably abandons the Gateway project, it should remain in the cumulative impact section. The same is true of other projects whose permitting status is uncertain.

B. Shortcomings of the DEIS's cumulative impacts analysis

The DEIS's cumulative impact analysis states the obvious: that cumulative increases in fossil fuel-related unit train and vessel traffic in and along the Columbia, and throughout the state, will add to the many negative impacts of MBT's proposal. But to satisfy SEPA and to assist a decision-maker, the cumulative impacts analysis must go further. It must explain—in a meaningful, tangible way—how the human environment in the study area would look and function if the proposed growth in fossil-fuel and other shipping occurs.

CEQ guidance confirms that "cumulative effects analysis should be conducted within the context of resource, ecosystem, and human community thresholds—levels of stress beyond which the desired condition degrades." [209] Unfortunately, the cumulative impact assessment falls short of this standard. It does not provide readers with any sense of whether impacts will cumulatively cross acceptable "resource, ecosystem, and human community thresholds." *Id*. Nor does it disclose whether the "desired condition" of Longview, the Columbia River and its estuary, or the Pacific Northwest will survive all the proposed fossil-fuel export projects. *Id*. These failures prevent the DEIS from presenting the "reasonably thorough discussion" of environmental impacts that SEPA requires. *PT Air Watchers v. State, Dep't of Ecology*, 179 Wash. 2d 919, 927 (2014).

In many places, major conclusions are presented as vague generalities. In others, dramatic changes that will effect countless people are buried in minutiae. For example, while the DEIS confirms that the project will contribute to astonishing increases in railroad traffic**—in places, 200 trains per day—**it appears to largely dismiss the profound impacts this change would represent. For example, the DEIS is certainly correct that "The rail traffic attributable to the cumulative projects would increase vehicle delay at public at-grade crossings as a result of increased gate downtime." *See, e.g.,* DEIS at 6-19. However what does it actually mean for people? Simply stating that 200 trains per day, where there is capacity for 76, is "would result in congestion or delays" is not particularly illuminating. DEIS 6-37. **One must wade through the details, and do one's own calculations to realize that many at grade crossings in Spokane County will be closed for almost seven hours a day.** DEIS 6-52. Where speeds are slower that number could double.

Other critical information crucial to the public and decisionmakers appears buried in a way that will risk being overlooked. For example, the DEIS acknowledges that the cumulative impact of all the fossil fuel projects will be **110 rail accidents per year**, with twelve of them attributable to the MBT project. Is Washington really willing to trade a coal or oil train accident statewide every three days for the benefit of serving as a transit point for fossil fuel companies? Is this project worth an additional rail accident each month? The DEIS is silent on the particular risks posed by oil trains, which in recent years have created emergencies and even disasters. Similarly, the DEIS discloses that there will be delays in emergency vehicles due to increased blockage, but that delay isn't place in any context or fleshed out with details. How long will the

[209] Ex. 54.

delays be? How many emergency vehicles are going to be affected waiting for coal and oil trains? How will delays impact patients with life-threatening injuries, strokes and heart attacks?

Other rail traffic impact information is presented in an impenetrable format that doesn't aid anyone's understanding of the specifics. For example, Table 6-8 provides data on vehicle and train volumes at certain crossings in Cowlitz County, but zero information on how the interaction of the two will result in delays. Information is presented in terms of changes to the "level of service" at these crossings, but that isn't particularly informative. How long each day will these crossings be closed, and for how long? How long will drivers have to wait as each of the **142 trains per day** crosses through their communities? DEIS 6-44.

Similarly, the vessel transport section documents a near-doubling of existing traffic in the Columbia River, with **nearly eight and a half thousand total vessel transits annually**. DEIS 6-55. This means that the Columbia effectively would be transformed into a tanker superhighway, with near constant movement of massive vessels, many of them carrying coal and oil. But the increase in environmental impacts and risks from this transformation is waved away with zero analysis or explanation. For example, while recognizing that "greater number of vessels and trains in the study area could increase the potential for fuel spills," it then dismisses without any quantification or analysis the impact of such spills as "temporary and localized." DEIS 6-28. It also uses modeling that is not explained or transparent to find that the risks of allisions is "low." *Id*. 6-57.

To the contrary, an oil or fuel spill in the Columbia would be an existential-level threat to the environment and for the communities that rely on it. Remarkably, the DEIS does not actually discuss what a major crude oil or fuel spill in the Columbia would mean. Similarly, what does doubling the amount of large vessel traffic in the lower Columbia mean for wake stranding, shoreline erosion, and other impacts that are critical issues? Generalized conclusions that the project would "increase the potential for fish stranding" are not at all helpful without the context of "resource, ecosystem, and community thresholds . . . ." as directed by CEQ guidance. Without these types of threshold analyses, and without placing the risks in the appropriate scale and context, the DEIS's cumulative impact analysis does not meaningfully help decision-makers faced with choices about whether this and other proposed projects are consistent with SEPA.

Of particular concern are the GHG-related impacts of exporting all the coal from currently proposed projects. As the DEIS acknowledges, collectively the existing and proposed projects would constitute a staggering 126 million tons/year increase in the amount of coal leaving the west coast. DEIS 6-71. The international market implications of this are potentially huge, but the information provided in the DEIS is extremely thin. **For example, as discussed above, the DEIS should disclose the total amount of CO^2 associated with that amount of coal combustion: 257 million tons/year—almost three times the state's entire GHG emissions from all sources.** (And that number doesn't include the oil projects.) While that ultimate contribution could be reduced via displacement, the FEIS should start with the known total and then discuss potential reductions from displacement and offsets.

Additionally, the information provided in the DEIS on placing these GHGs in context is both confusing and inadequate. Table 6-28 doesn't provide any information on annual emissions, which is the most comprehensible format, and appears to use a "total" based on unrealistically short life span of 11 years of full operations.[210] Moreover, the DEIS provides no information on how this information was obtained—which of the various coal market scenarios were used, and what set of assumptions? The fact that the DEIS comes up with a number of tons of "total" GHG emissions that is such a tiny fraction of the known annual coal combustion emissions raises questions about the adequacy and transparency of this analysis. Equally mystifying is that the DEIS then goes on to only attribute a tiny portion of this to Washington state—only 0.290 million tons/year. DEIS 6-73. However, the whole point of the analysis is that Washington state would be the proximate cause of the much larger amount of emissions associated with coal combustion. No matter how calculated, the public should see just how significantly the terminal would undercut Washington's commitment to reducing greenhouse gases. Even using the DEIS's flawed figure of 62.5 million tons of year, it is evident that authorizing these various projects is entirely inconsistent with our legal obligation to reduce our total GHG footprint to 66 million tons by 2035 and 44.2 million tons by 2050. In other words, the DEIS contains information that provides a clear and powerful legal basis on which to deny this and other similar fossil fuel export projects. That information should be highlighted and as clear as possible.

X. THE DEIS PRESENTS A ONE-SIDED ANALYSIS OF ECONOMIC IMPACTS

SEPA regulations generally do not require a full cost-benefit analysis of projects. However, to the extent that economic information is included, it must be balanced and inclusive. *Hughes River Watershed Conservancy*, 81 F.3d at 446–48 ("it is essential that the EIS not be based on misleading economic assumptions"). An EIS cannot "trumpet" the economic benefits of a project without also acknowledging its costs. *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir.1983). In other words, to the extent its considered, economic information must be accurate and fair. *Id*. Moreover, a DEIS cannot simply incorporate without question a proponents' economic claims but must provide some independent review.

Unfortunately, the DEIS falls short of this standard. While disclaiming explicitly that it is "intended to be a cost benefit analysis," DEIS 3.2-5, it provides a one-sided picture of economic benefits simply repeated by the proponent, without any countervailing assessment of economic harm. The project applicants commissioned the BERK economic assessment included in the DEIS, but no independent third party has evaluated the study's conclusions. It does not appear that these claims have been subject to any scrutiny or review by the DEIS contractor or the Co-leads. Yet there is reason to treat its conclusions with skepticism. For example, the BERK study takes as a given the direct job projections provided by MLBT. But MLBT has not provided the public with any documentation to back up these job projections.

There are numerous data gaps that must be filled in to complete the economic picture.

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[210] Table 6-28 uses the word "total" but appears to potentially mean annual. This needs to be clarified.

The Millennium Bulk Terminal's Draft Environmental Impact Study fails to provide an accurate assessment of the project's economic impact to the local or regional economy. Instead, the DEIS only includes the projected benefits as calculated by BERK Consulting in 2012. Indeed, somehow the DEIS concludes that there will be no significant impact on "social and community cohesion and public services, the local economy, or utilities" without even making the barest effort to analyze impacts beyond simply repeating the applicant's preferred study. DEIS 3.2-30/.

There are several limitations to relying strictly on the BERK study as a means to evaluate MLBT's potential economic impact. For example, the only area of study on potential economic downside is a narrow assessment how increased train traffic could cause delays in local commercial areas. Given the DEIS's severely limited geographic scope of study, the consultants conclude the impact would be negligible. DEIS 3.2-26. While conceding that "this vehicle delay could affect accessibility to local businesses during the peak traffic hour without track infrastructure improvements" the DEIS simply dismisses them as "negligible". Id. 3.2-27.

The question for decision-makers to consider is not simply the number of potential new employees but the net economic benefit for the local and regional communities. Both sides of a project's balance sheet must be considered in evaluating its economic merits. The many foreseeable negative economic risk factors that were not considered in the DEIS need to be evaluated. The report fails to include a comprehensive—and geographically relevant—economic impact assessment, which would consider MBT's potential negative economic impacts on areas including but not limited to:

- Local and regional businesses due to the congestion, blocked roadways and noise from increased train traffic through commercial areas, and its consequences for productivity, sales, etc.;
- Other state and regional exporters such as agricultural producers that utilize rail services and do not have the flexibility for shipping delays;
- Increased tax burden on local communities with the need to upgrade rail crossings, as the railroads only cover a maximum of 5% of these very costly projects:
- Fishing and recreational industries (including tribal fishing) due to risks from increased tanker traffic and the heightened possibility of collisions and spills;
- Local and regional businesses impacted by "stigma" impact of coal;
- Decrease in property values in response to a substantial increase in train traffic along the full length of the coal transport corridor, which has been shown to decrease values particularly in residential neighborhoods.
- Health care costs, including emergency department visits and hospitalizations,

Similarly, while dismissing coal dust pollution on nearby homes and businesses as at worst a "nuisance," the DEIS neglects to quantify the economic impact of coating homes and businesses with coal dust, or potential liabilities for the County if such harms become actionable.

These are not theoretical or imaginary impacts. Robust economic analyses have been prepared for the other major coal export facility recently proposed in Washington state—the Gateway Pacific Terminal near Bellingham.[211] Academic studies in other U.S. cities document a significant drop in home values as rail traffic increases.[212] These analysis document many of the adverse impacts described above. While there are differences between the two communities, many of the impacts described in these reports are salient to the Longview project. In short, having trumpeted the alleged economic benefits of the project, the EIS must then also include a fair analysis of the potential economic risks. In this regard, it falls far short.

A related concern is the economic health of the proponent. Will it be able to follow through on its commitments, or will the community be left with another piece of useless infrastructure? Will it be able to comply with its mitigation obligations? As the Co-leads understand, the MBT project is being promoted by a coal company that recently declared bankruptcy and a private capital investor firm that does not actually operate anything. Recently, one of the co-owners of the project, Arch Coal, sold its 38% share of the terminal in exchange for exactly zero dollars.[213] Also as the Co-leads understand, the economic climate that would make this project even modestly profitable does not exist and is not anticipated to exist in the foreseeable future.[214] Indeed, the fundamental premise of the DEIS—that U.S. coal can "compete in Asian energy markets" due to an "anticipated growth in demand for the export of U.S. coal"—is fundamentally flawed. DEIS at 2-2. As described above, and in the accompanying expert report of Dr. Powers et al., U.S. coal cannot compete in Asian markets and the "anticipated growth" in coal demand evaporated years ago. The entire justification for the project is illusory.

The proponent has continually shifted the claimed need for the project: at first it was China, but then coal imports to China plummeted and disappeared. The case for India disappeared soon thereafter. The DEIS claims that need exists in South Korea and Japan but this is likely a chimera as well. Massive coal investment in Japan is unlikely for numerous reasons.[215] If Japan were to follow through on its uncertain plans to build significant new coal capacity, it would be double what could be acceptable under that nation's existing coal commitments.[216] Most likely, the hoped-for coal boom in East Asia will follow the same fate as the speculative bubbles in other parts of Asia. This information is relevant to the Co-leads ultimate choices as to whether or not to authorize the project, and whether any financial

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[211] Ex. 55; Ex. 56; Ex 57.
[212] Ex. 58.
[213] Ex. 59.
[214] Ex. 60.
[215] Ex. 61.
[216] Ex. 62.

assurances would be imposed to ensure that the project doesn't end up with more unfunded liabilities for the community.[217]

CONCLUSION

The DEIS provides a strong foundation for assessing the many serious environmental impacts of the MBT project. In particular, the Co-leads correctly identified a number of indirect impacts, such as transportation impacts and GHG emissions, that fall within the appropriate scope of review. However, the DEIS misses key impacts and fails to take a hard look at all the direct, indirect, and cumulative impacts of the proposed project. Our comments are offered in the spirit of resolving those shortcomings so that the FEIS can assist Co-leads and other responsible agencies in making a fully informed and transparent decision. We believe that once the shortcomings are resolved and the true environmental, economic and GHG impacts of this project are fully disclosed, the only correct outcome will be to deny the project.

Thank you for your consideration of these comments. Coalition members stand ready to work with the Co-leads and their staffs to ensure that the FEIS is legally compliant, comprehensive, and useful.

Sincerely,

Jan. Hasselman

Columbia Riverkeeper, Friends of the Columbia Gorge, Sierra Club, Washington Environmental Council, Climate Solutions, Oregon Physicians for Social Responsibility, Washington Physicians for Social Responsibility, and RESources for Sustainable Communities

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[217] Washington law requires financial assurances for certain vessels and terminals engaged in transportation of "hazardous substances." RCW 88.40.025. Even if the coal stockpiles do not fall into this regulatory definition, the Co-leads have the authority to require such assurances pursuant to their general SEPA authorities. Given the financial weakness of both the proponents and their business model, such assurances would be warranted here to ensure that the community is not saddled with another stranded asset and/or hazardous mess on prime waterfront property.

My name is Lindsey Sears. I hold an M.A. (2012) degree in Geography from California State University, Northridge, where I specialized in GIS and air dispersion modeling. My thesis, titled "Diesel Trucks: Health Risk and Environmental Equity," involved the use of USEPA's AERMOD model to determine concentrations of diesel particulate matter (DPM) around several Southern California freeways, focusing on pollution from port-related diesel truck traffic. I also performed a population analysis examining inequities related to race and income groups exposed to DPM.

I have broad experience as a consultant providing litigation support. I have performed numerous air quality modeling analyses using AERMOD and other air dispersion models, prepared meteorological data using AERMET, performed health risk assessments, and created many detailed maps and graphics. I have experience preparing analyses of various emission types from many sources and facilities including coal-fired power plants, agricultural fields, and mobile sources.

I have reviewed the Air Quality Technical Report, prepared by ICF International, included in the Millennium Bulk Terminals – Longview SEPA Environmental Impact Statement (DEIS). My observations indicate several shortcomings in the modeling methodology that result in considerable underestimations of modeled concentrations. I performed two modeling analyses to address these deficiencies.

1) The modeling performed by ICF does not estimate concentrations over the facility property.

The original modeling performed by ICF estimates concentrations for a receptor grid that does not include onsite locations (Figure 1). There is no reason to exclude receptors within the facility. I generated receptors in 50 meter increments over a 1.7 km by 2.7 km Cartesian grid covering the facility property (Figure 2). I obtained terrain elevation data for these locations using National Elevation Dataset (NED) GeoTiff data. I extracted terrain elevations from the NED files using USEPA's AERMAP program, v. 11103, with 1/3rd arc-second (10 meter horizontal) resolution.

I used this new receptor grid to model 1-hour NO_2, 1-hour SO_2, 24-hour $PM_{2.5}$, and 24-hour PM_{10} to determine whether results would be in violation of the NAAQS. I used ICF's existing modeling files and meteorological data and USEPA's AERMOD air dispersion model v. 15181 to calculate concentrations for the new receptor grid. I modeled both onsite and offsite sources.

I also corrected the original modeling methodology for PM_{10} calculations to comply with the form of the NAAQS. The 24-hour PM_{10} NAAQS is not to be exceeded more than once per

year on average over a 3-year period.[1] Therefore the reported modeled impact should be the 3-year average of the second highest concentration for each receptor. ICF modeled three years together and reported the second highest concentration over the 3-year period. I corrected this by modeling the years 2001-2003 separately and calculating the second highest concentration at each receptor, then averaging these values over the three years to be consistent with the form of the NAAQS. My approach is more conservative, meaning it will tend to produce lower results, than ICF's approach on this issue.

The results (Table 1) indicate a violation of the 1-hour SO_2 NAAQS as well as the 24-hour PM_{10} and $PM_{2.5}$ NAAQS. This is true even before adding background levels.

Table 1: AERMOD Results for Onsite and Offsite Sources, with Onsite Receptors

Pollutant	Averaging Period	UTM Easting	UTM Northing	Modeled Impact (µg/m^3)	Background (µg/m^3)	Total Predicted Concentration (µg/m^3)	NAAQS (µg/m^3)
NO_2	1-hour	499300	5109850	117	57	174	188
PM_{10}	24-hour	499550	5110300	309	23	332	150
$PM_{2.5}$	24-hour	499550	5110300	45	18	63	35
SO_2	1-hour	499250	5109100	232	15	246	196

2) The modeling performed by ICF does not include emissions from unpaved roads caused by haul trucks.

The modeled concentrations that ICF calculated do not take into account emissions of PM_{10} and $PM_{2.5}$ from unpaved roads caused by haul trucks. However, fugitive PM emissions from roads is a standard emission source in most air quality impact analysis of industrial facilities.

The Air Quality Technical Report explains that vehicles would access the project area from Industrial Way. To add the emissions from the haul roads to the previously modeled scenarios, I created volume sources along the dirt road off of Industrial Way and along Dike Road toward the Stockpile Areas (Figure 3) consistent with the Proposed Action illustrated in Figure 2 of the Air Quality Technical Report. I again used ICF's existing modeling files and meteorological data and USEPA's AERMOD air dispersion model v. 15181. I added emission rates for the unpaved roads provided by Dr. Ranajit Sahu, and implemented a very conservative

[1] https://www.epa.gov/criteria-air-pollutants/naaqs-table

control factor of 75%. Again, conservative in the air modeling context means an assumption which tends to produce lower resulting concentrations. I have no evidence to establish that the Facility will apply any controls to limit fugitive PM emissions from the haul roads during construction or that if they did apply controls they would achieve a 75% reduction in emissions.

I followed the same methodology in modeling PM_{10} as outlined above for consistency with the NAAQS. I modeled the receptor grid I generated as well as the fenceline receptors originally modeled by ICF.

My results indicate violations of the NAAQS for both 24-hour PM_{10} and 24-hour $PM_{2.5}$, even before adding background levels (Table 2).

Table 2: AERMOD Results for Onsite and Offsite Sources including Unpaved Roads, with Onsite Receptors

Pollutant	Averaging Period	UTM Easting	UTM Northing	Modeled Impact (µg/m^3)	Background (µg/m^3)	Total Predicted Concentration (µg/m^3)	NAAQS (µg/m^3)
PM_{10}	24-hour	499600	5109500	431	23	454	150
$PM_{2.5}$	24-hour	499550	5110300	46	18	64	35

In summary, the modeling results for receptors within the facility property indicate NAAQS violations for SO_2, PM_{10}, and $PM_{2.5}$ when modeled with assumptions made by ICF in their original modeling analysis. There is no reason to have excluded these receptors from their analysis. The results for PM_{10} and $PM_{2.5}$ are even higher when considering the emissions from unpaved roads. It should be noted that these results exceed the NAAQS even before background levels are added to the modeled impacts.

Figure 1: ICF's modeled receptors

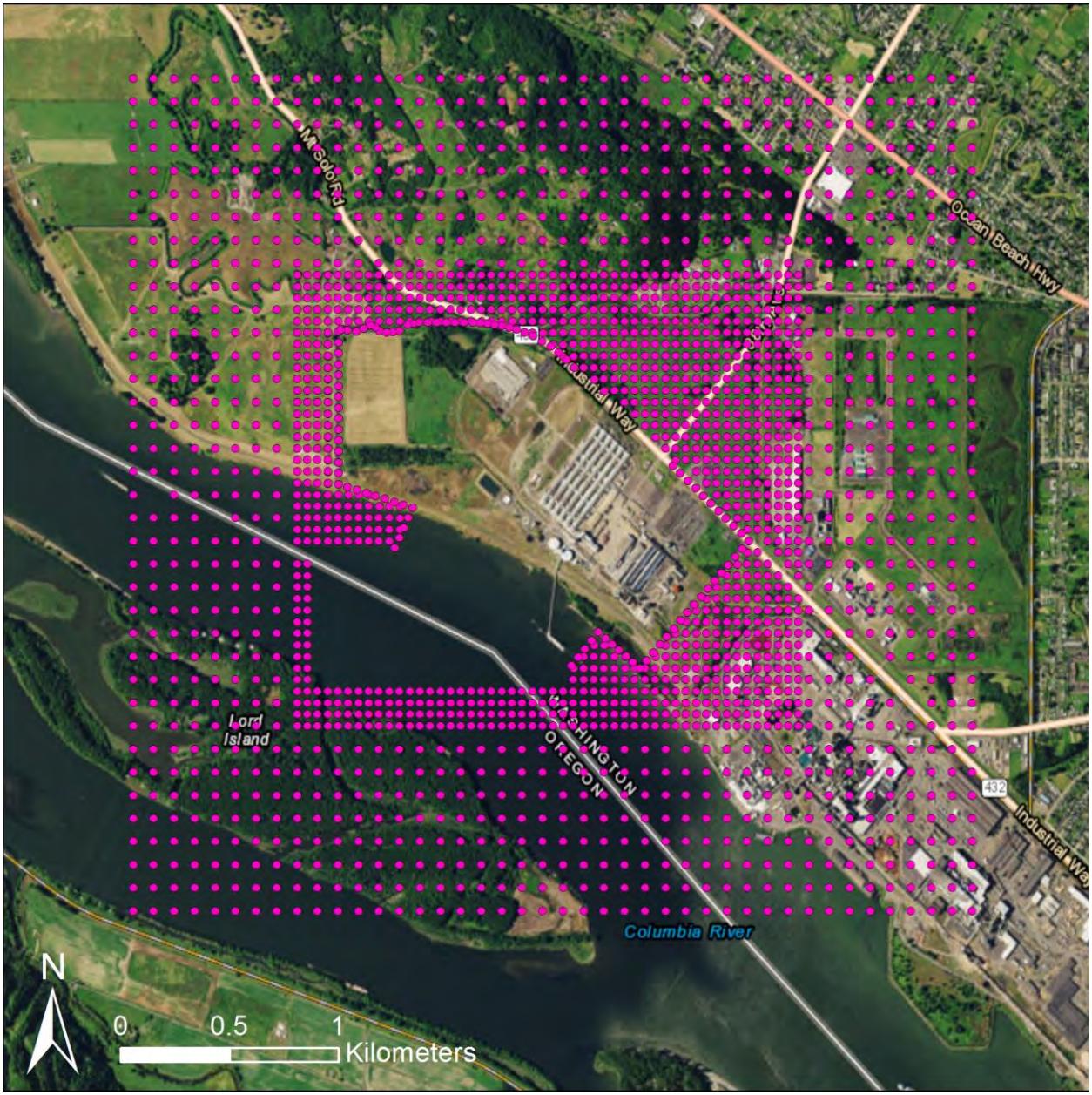

Figure 2: Receptor grid covering the facility property

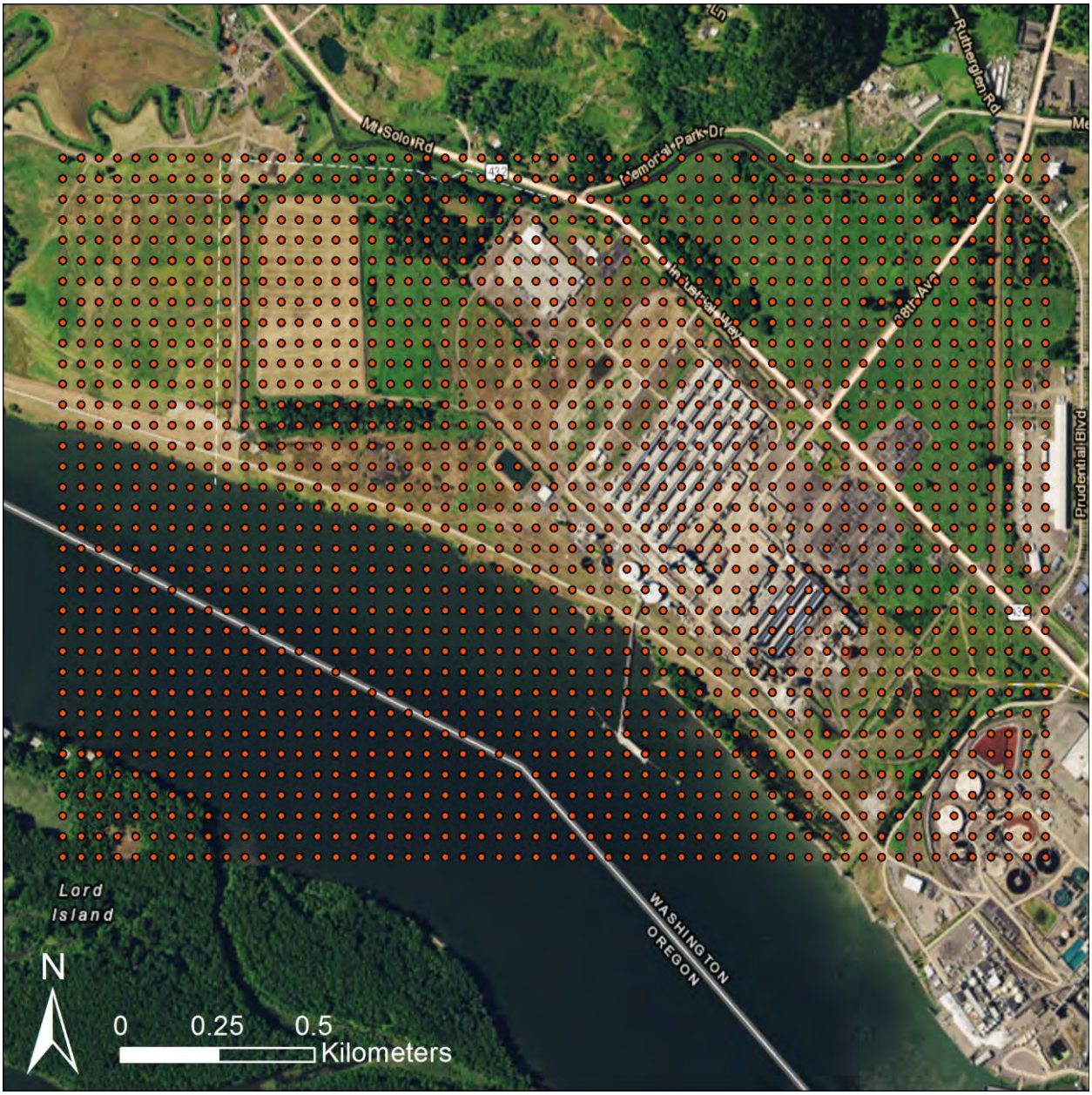

Figure 3: Unpaved Roads Volume Sources

DECLARATION OF DR. RANAJIT (RON) SAHU

1. My name is Dr. Ranajit Sahu. I am over twenty-one years of age, and I am competent to testify. The statements set forth in this declaration are based on my own personal knowledge. I am making and I understand that I am making this statement under penalty of perjury.

2. I received my B.S. in mechanical engineering from the Indian Institute of Technology (Kharagpur, India) in 1983, and my M.S. and Ph.D. in mechanical engineering from the California Institute of Technology ("Caltech") in 1984 and 1988, respectively. Since graduating from Caltech, I have worked in the fields of environmental, mechanical and chemical engineering for over 28 years. My work experience has included, among other things: engineering and environmental consulting, multimedia environmental regulatory compliance involving numerous environmental statutes, including the Clean Air Act; the design, modification, and specification of pollution control equipment and other equipment for multiple coal-fired power plants and coal terminals; work on preparing and/or reviewing hundreds of air permits for numerous industrial and municipal facilities; teaching, from 1992 through 2010, roughly 30 courses on air pollution and its control at several universities, including the University of California, Los Angeles and the University of Southern California; and providing expert services to the U.S. Environmental Protection Agency, the U.S. Department of Justice, and various states in multiple Clean Air Act lawsuits. Additional details regarding my background and experience can be found in my resume provided in the attachment to this declaration.

3. As part of my work over the past 25 years on Clean Air Act permits and pollution controls, teaching courses on air pollution, and serving as an expert in Clean Air Act lawsuits, I

estimate that I have reviewed hundreds of air permit applications and air permits for industrial facilities, including materials trans-shipment/trans-loading terminals handling materials such as coal and petroleum coke. I have also reviewed many air permits for coal-fired power plants which include large coal handling and storage facilities.

4. I have reviewed the Draft Environmental Impact Statement (Draft EIS) for the proposed Millenium Bulk Terminal ("Terminal") to be located in Longview, Washington. This coal export terminal, per the Draft EIS "…would receive coal from the Powder River Basin in Montana and Wyoming and the Uinta Basin in Utah and Colorado via rail shipment. Coal would be unloaded from rail cars, stockpiled and blended, and loaded by conveyor onto ocean-going vessels for export at two new docks located in the Columbia River. Once construction is complete, the Proposed Action could have a maximum annual throughput capacity of up to 44 million metric tons of coal per year."[1]

5. I have reviewed the air emissions estimates associated with the proposed Terminal. This includes expected emissions of various air contaminants, including criteria pollutants, hazardous/toxic air pollutants, and greenhouse gases from numerous sources and activities that would not be emitted but for the proposed Terminal.

6. Specifically, I did not find emissions attributed to diesel-fired emergency generators or diesel-fired emergency fire pumps in the air emission calculations contained in the Draft EIS. While it is possible that I may have simply missed such emissions estimates, to the extent that such emissions are not present or provided in the Draft EIS, that would constitute an omission in my opinion.

7. Diesel-fired emergency generators are ubiquitous in industrial facilities in order to provide electrical power for critical loads in the event of a failure of the typical, grid power

[1] Draft EIS, Volume 1, Cover Letter, Washington State Department of Ecology and Cowlitz County, April 29, 2016.

supply. Almost all industrial facilities, including the Terminal, will rely on electricity to power several critical functions. This includes the ability to run electrically-powered equipment, task lighting, process controls, and security lighting, among others. As such, diesel-fired generators are present in most facilities in order to provide electrical power seamlessly when the grid power supply is interrupted, for whatever reason. When present, such diesel generators, powered by diesel engines are periodically tested to ensure that they will properly function when needed. Typically, they are tested weekly, monthly and annually – and various air contaminants are emitted when such tests are conducted. These emissions are usually included in air emissions inventories from facilities during the assessment for air permitting or environmental impact assessments. As such, I find the lack of such air emissions puzzling.

8. Similar to the above, I also find the lack of air emissions from diesel-fired emergency fire pumps at the Terminal to also be puzzling. Fire suppression equipment is critical at most industrial facilities, and even more so at the proposed Terminal, which will handle large quantities of not just coal but also fuels such as gasoline etc. to support Terminal operations. As such, prudence (and likely insurance requirements, driven by the National Fire Protection Code) demands that such backup power for critical fire-fighting equipment such as fire water pumps, sprinklers, etc. be present and in working condition (when called upon) at the Terminal. Therefore, the lack of air emissions from diesel-fired emergency fire pumps is an omission in my opinion.

9. Together, the lack of air emissions attributed to diesel-fired emergency generators and fire pumps, underestimates, in my opinion, the estimated air emissions and their impacts from the proposed Terminal. This is over and above any and all potential issues relating to air emissions from sources and activities already accounted for in the Draft EIS.

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 8th day of June, 2016.

Dr. Ranajit Sahu

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

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EXPERIENCE SUMMARY

Dr. Sahu has over twenty three years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

Specifically, over the last 20+ years, Dr. Sahu has consulted on several municipal landfill related projects addressing landfill gas generation, landfill gas collection, and the treatment/disposal/control of such gases in combustion equipment such as engines, turbines, and flares. In particular, Dr. Sahu has executed numerous projects relating to flare emissions from sources such as landfills as well as refineries and chemical plants. He has served as a peer-reviewer for EPA in relation to flare combustion efficiency, flare destruction efficiency, and flaring emissions.

He has over twenty one years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public. Notably, he has successfully managed a complex soils and groundwater remediation project with a value of over $140 million involving soils characterization, development and implementation of the remediation strategy including construction of a CAMU/landfill and associated groundwater monitoring, regulatory and public interactions and other challenges.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty three years include various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including EPA, the US Dept. of Justice, California DTSC, various municipalities, etc.). Dr. Sahu has performed projects in over 44 states, numerous local jurisdictions and internationally.

In addition to consulting, Dr. Sahu has taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management) for the past seventeen years. In this time period he has also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.) public sector (such as the US Department of Justice) and public interest group clients with project management, air quality consulting, waste remediation and management consulting, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, Caltech, Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992-present.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-present.

Air and Waste Management Association, West Coast Section, 1989-present.

PROFESSIONAL CERTIFICATIONS

EIT, California (# XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2011.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C.Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R.Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Puchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

“The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants,” with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

1. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

(a) In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

2. Matters for which Dr. Sahu has have provided affidavits and expert reports include:

(b) Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

(c) Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

(d) Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

(e) Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).

(f) Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).

(g) Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

(h) Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (Eastern District of Kentucky).

(i) Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

(j) Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

(k) Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

(l) Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

(m) Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

(n) Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

(o) Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

(p) Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

(q) Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

(r) Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with General Power Products, LLC v MTD Products Inc., 1:06 CVA 0143 (Southern District of Ohio, Western Division)

(s) Experts Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

(t) Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

(u) Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

(v) Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy et al., v Duke Energy Carolinas, LLC. in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

(w) Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.

(x) Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.

(y) Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas.

(z) Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

(aa) Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina).

(bb) Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

(cc) Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(dd) Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(ee) Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(ff) Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(gg) Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(hh) Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

(ii) Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (US District Court for the Eastern District of Michigan).

(jj) Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

(kk) Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(ll) Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(mm) Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(nn) Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of Plaintiffs v. Public Service Company of New Mexico (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE). (US District Court for the District of New Mexico).

(oo) Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(pp) Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(qq) Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Case No. 5:10-cv-00156-DF-CMC (US District Court for the Eastern District of Texas, Texarkana Division).

(rr) Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(ss) Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

(tt) Expert Report (March 2011), Rebuttal Expert Report (Jue 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(uu) Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority,* Civil Action No. 4:11-cv-00791 (US District Court for the Southern District of Texas, Houston Division).

(vv) Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(ww) Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(xx) Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.,* Civil Action No. A-08-CA-648-LY (US District Court for the Western District of Texas, Austin Division).

(yy) Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.,* Case No. 3:10-cv-747 (TJM/DEP) (US District Court for the Northern District of New York).

(zz) Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association,* Case No. 11-417-MJP (US District Court for the Western District of Washington).

(aaa) Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(bbb) Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency,* Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

(ccc) Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

(ddd) Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality,* Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

(eee) Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.,* Civil Action No. 07-CV-5298 (JKG) (US District Court for the Eastern District of Pennsylvania).

(fff) Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project

(ggg) Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

(hhh) Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

(iii) Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.

(jjj) Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

(kkk) Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.

(lll) Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

(mmm) Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.

(nnn) Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(ooo) Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

(ppp) Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of A. J. Acosta Company, Inc., v. County of San Bernardino, Case No. CIVSS803651.

(qqq) Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

(rrr) Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.

(sss) Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

(ttt) Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.

(uuu) Expert Report (January 2014) on behalf of Baja, Inc., in Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).

(vvv) Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States, Civil Action No. 13-1820 RC (United States District Court for the District of Columbia).

(www) Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).

(xxx) Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

(yyy) Declaration (July 2014) on behalf of Public Health Intervenors in the matter of EME Homer City Generation v. US EPA (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).

3. Occasions where Dr. Sahu has provided oral testimony in depositions, at trial or in similar proceedings include the following:

(zzz) Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.

(aaaa) Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

(bbbb) Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

(cccc) Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

(dddd) Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et* al. *v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).

(eeee) Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia ????.

(ffff) Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.

(gggg) Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.

(hhhh) Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.

(iiii) Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.

(jjjj) Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(kkkk) Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al*.

(llll) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(mmmm) Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(nnnn) Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(oooo) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

(pppp) Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(qqqq) Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(rrrr) Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(ssss) Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(tttt) Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

(uuuu) Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(vvvv) Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(wwww) Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(xxxx) Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(yyyy) Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(zzzz) Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(aaaaa) Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(bbbbb) Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(ccccc) Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(ddddd) Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(eeeee) Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(fffff) Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(ggggg) Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

(hhhhh) Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

(iiiii) Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(jjjjj) Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

(kkkkk) Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

(lllll) Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(mmmmm) Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(nnnnn) Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

Comments on the Greenhouse Gas Impacts and the Modeling of Coal Flows in the Millennium Bulk Terminals Longview SEPA Draft Environmental Impact Statement

A Report Prepared for

Earth Justice

and

The Sierra Club

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Executive summary

Cowlitz County, WA, and the Washington State Department of Ecology have prepared a Draft Environmental Impact Statement (DEIS) for the proposal by Millennium Bulk Terminals-Longview LLC (MBTL) to construct and operate a coal export terminal along the Columbia River in the Longview area of Cowlitz County, WA (Longview coal port). Among the significant adverse impacts of that proposed Longview coal port discussed in the DEIS was the impact of the operation of that port on the release of greenhouse gases (GHG) and the contribution that pollution would make to global warming. The DEIS included direct GHG emissions, indirect emissions from coal transportation, and emissions related to changes in coal and natural gas combustion that would be caused by the project. These comments focus only on the latter, which dwarf the other emissions.

1. The DEIS Conclusions on Carbon Pollution Resulting from the Longview Port

Five different scenarios are modeled in the DEIS assessment of the GHG impacts of the proposed Longview coal port. These include the (1) "Upper Bound", (2) "Lower Bound", (3) "Past Conditions (2014)", (4) "2015 Energy Policy", and (5) "Cumulative" scenarios. All of these scenarios were modeled assuming the Longview coal port supplies 44 million metric tons of coal to Asian countries starting in 2025.[1] The result of this is compared to "No-Action" alternatives in which the Longview coal port is not built. The modeled estimates of GHG emissions impacts from these scenarios ranges from small *reductions* in carbon pollution impacts to the addition of approximately 30 million metric tons per year (MMtpy) of carbon dioxide equivalent (CO_{2e}) released into the atmosphere.[2] 30 MMtpy of CO_{2e} would be the equivalent of the carbon emissions of 8.7 average size coal-fired electric generators in the U.S. [3]

Among this wide range of scenarios addressed in the DEIS, the DEIS identifies the 2015 Energy Policy scenario as the "preferred scenario". Under this preferred scenario, the DEIS estimates that a cumulative 37.6 million metric tons of CO_{2e} emissions would be added to the atmosphere between 2018 and 2038. Under this scenario, the DEIS concludes that carbon emissions associated with the proposed Longview coal port would be adverse, significant, and permanent.

[1] The Cumulative scenario is *not* a scenario that focuses exclusively on the impacts associated with the proposed Longview coal port. In includes impacts associated with other proposed ports that are not directly a part of the proposed action. For that reason it is not clear that it should be compared to the other four scenarios. It serves a different purpose. The Cumulative scenario also assumes other west coast coal ports will come on-line in 2030 and ship another 56 MMtpy of coal to Asian countries.

[2] This is for the Upper Bound scenario. For every metric ton of coal shipped from the port, 0.7 metric tons of additional carbon pollution is released. The Cumulative scenario projects a 43.4 MMtpy of carbon pollution, but all of those carbon emissions are not associated with just the Longview coal port.

[3] EPA estimates that the average U.S. coal-fired electric generating plant emits 3.436 MMtpy of CO_{2e}. https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references

2. The DEIS's Approach to Analyzing Coal Markets

Unlike past attempts to dismiss concerns over exporting Powder River Basin (PRB) and other western coal to Asian nations, the DEIS does not assume a "perfect substitution" of PRB coal for coal that otherwise would have been burned in Asia. Instead, the DEIS recognizes that coal is bought and sold in international and domestic markets where supply and demand interact with each other. If an aspect of one market changes, such as increasing the supply of coal sold into a particular market, it triggers adjustments throughout energy markets until a new equilibrium is reached. Under this new equilibrium, prices and consumption quantities are likely to be different than before the market adjustments. The DEIS modeled some of the market adjustments that would be triggered by the construction and operation of the proposed Longview coal port. The DEIS lists the market impact that these adjustments would have, in all of the scenarios:[4]

- It would increase the supply of low cost coal to international markets.
- The increase in supply would decrease international coal prices.
- The decrease in international coal prices could increase the international consumption of coal energy.
- The increase in international demand for U.S. coal could increase U.S. coal prices.
- An increase in U.S. coal prices would reduce domestic coal demand.

In particular, the DEIS assumed that the consumption of coal energy in Asia was sensitive to changes in the delivered cost of coal. A decrease in the delivered cost of coal would induce increased consumption of coal energy and increased emissions of carbon pollution. In U.S. coal markets, the DEIS assumed that coal competes with natural gas and renewable electric generation in suppling U.S. electricity demand. Higher coal prices, for instance, would reduce the use of coal, replace it with lower carbon sources of electricity, and reduce the overall carbon pollution from electric generation in the U.S. Conceptually these are the appropriate market adjustments to take into consideration when evaluating the impact of the proposed Longview coal port on total carbon pollution.

3. Evaluating the Results of the DEIS Scenario Analysis

The purpose of the Environmental Impact Analysis process is to estimate the likely impacts associated with a proposed action, in this case, the construction and commercial operation of the proposed Longview coal port. If market conditions do not make that proposed coal port commercially viable, it will not be built; or, if it is built, it will not be operated and there will be no environmental impacts to evaluate. That means that the scenarios considered have to be built around coal market conditions in which the proposed port will be able to operate at its full capacity for the modeled life of that port. Scenarios that do not meet that condition cannot provide useful information on the environmental impact of the proposed coal port.

[4] DEIS p. 5.8-17

The DEIS explicitly expresses significant doubts about the competitiveness of the coal exported through the proposed Longview coal port under the market conditions assumed in four of the five scenarios it models. Our own analysis of the competitiveness of PRB coal under current and likely future Pacific Basin coal market conditions provided in these comments confirm the DEIS's doubts. The DEIS refers to the "*challenging market environment for coal transported through the [Longview] terminal*" as it discusses the preferred 2015 Energy Policy, the Past Conditions (2014), and the Lower Bound scenarios. The DEIS says the under the Past Condition scenario, "*PRB coal would have a difficult time being cost-competitive…until international coal prices increase*."[5]

In all three of these scenarios (and the Cumulative scenario which is based on the Past Conditions market environment), there is no or very little induced coal energy consumption in the Pacific Basin as a result of the coal exports through the Longview port. Those exports to Asia price into existing markets at almost exactly the same delivered cost as the coal supplies previously serving those markets. The Longview port exports its full capacity each and every year at almost exactly the existing cost of coal in those Asian nations. The result is near perfect substitution of Longview coal for other Pacific Basin coal supplies with almost no impact on coal prices, coal energy consumption, or carbon pollution. Despite adopting the conceptually correct economic framework to evaluate these impacts, the results are almost the same as one would obtain if one assumed that coal energy consumption in Asia was not at all sensitive to the cost of coal.

These near zero carbon pollution impacts associated with three of the scenarios, including the DEIS's preferred scenario, is not an indication that the Longview coal exports would be environmentally benign. Rather, it is an indication that these DEIS scenarios were not consistent with a commercially viable Longview coal port and therefore provide no information as to what the actual impacts would be of a coal port operating in market conditions that actually supported it. We do not have to do any modeling to know that if the Longview coal exports are not competitive, there will be no exports and the port will have no impacts on coal markets.

4. The DEIS's Estimated Impacts of a Commercially Viable Longview Coal Port

The DEIS specifically designed one of its scenarios to "*provide for a robust market environment for coal transported through the [Longview coal] terminal*."[6] That is, that scenario sought to assure that market conditions for Western coal in the Pacific Basin would clearly support the full utilization of the Longview coal port's capacity. For that to be certain, significantly improved market conditions were assumed.

What the DEIS labels the Upper Bound scenario is the only scenario that the DEIS models that actually supports a commercially viable Longview coal port. That scenario should be relabeled the "Commercially Feasible Longview Port" scenario and used as the preferred scenario to indicate the likely impact associated with the Longview port operating at full design capacity for its modeled commercial life.

[5] ICF, Coal Market Assessment Technical Report, pp. 3-8, 3-9, 6-50, 6-51, 6-26. Greenhouse Gas Technical Report, p. 3-8.
[6] Ibid. p. 6-38.

The DEIS estimates that the induced demand associated with a "robust" Pacific Basin market for the Longview coal exports would result in a net annual increase in carbon pollution of almost 30 MMtpy of CO_{2e} averaged over the 2025 to 2040 period.[7] This is 24 times the level of carbon pollution that the DEIS calculates would result from the operation of the Longview port under the DEIS's "preferred" scenario, the 2015 Energy Policy scenario. As pointed out above, the DEIS found that such a Commercially Feasible Longview Port would be responsible for carbon pollution, with net changes in the U.S. energy markets, that are the equivalent of the emissions of eight coal-fired electric generating plants.

5. The DEIS Underestimates the Carbon Pollution Impacts of a Commercially Viable Longview Coal Port

Although the DEIS does provide one informative estimate of the carbon pollution that would be associated with a commercially viable Longview coal port, the DEIS subtracts a significant level of carbon pollution from the estimated increased carbon pollution in Asia, that results from the Longview coal port, to come up with a lower *net* impact when both Asian and U.S. coal markets are looked at together. That downward adjustment is tied to the DEIS's conclusion that the Longview coal port would cause a *decrease* in carbon pollution in the U.S. because supplying the Longview port with coal would require the mining of more costly coal supplies. This, the DEIS argues, would lead to reduced coal consumption in the U.S. and increased use of lower carbon sources of electricity such as natural gas and renewable electric generation.

The adjustment in U.S. coal markets that the DEIS makes is significant. On net, the DEIS estimates that 22 percent of the increase in carbon pollution in Asia as a result of Longview coal exports would be offset by the reduction in carbon pollution in the U.S.[8] Although such an offsetting impact is conceptually possible, we do not believe that empirically such an adjustment would be anywhere near as large as the DEIS calculates.

In 2014 PRB coal production was 379 MMtpy, 71 MMtpy below its peak 2008 production level of about 450 MMtpy. The DEIS projects that with the full capacity of the Longview port being utilized, the PRB coal mining levels under the Commercially Feasible Longview Port (upper bound) scenario would be 435 MMtpy, below previous levels of PRB coal production. In that sense the operation of Longview coal port at full capacity is not projected by the DEIS to push PRB coal mining above its previous levels of operation. Instead, the Longview port would help the PRB to put its existing capacity back into production. We do not believe that this recovery to past levels of operation would significantly increase PRB coal mining costs.

This suggests that the DEIS's net estimate of the combined impact of the changes in Pacific Basin and U.S. domestic coal markets on carbon pollution is underestimated. If the DEIS "offsets" are assumed to be empirically quite small, the total carbon pollution associated with the Commercially Viable Longview Port scenario increases from 29.8 to 37.6 MMtpy of CO_{2e} and the carbon equivalent in terms of additional average U.S. coal-fired generators rises from

[7] Ibid. Table 72.
[8] Ibid.

about 9 to about 11 additional coal-fired generators. As the DEIS concludes, that level of increased carbon pollution would represent a very large, permanent, and adverse impact.

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Part I: Introduction and Summary of the MBTL DEIS's Approach to and Conclusions about the Impact of the Proposed Longview Coal Port on Carbon Pollution Emissions

Introduction

Cowlitz County, WA, and the Washington State Department of Ecology have prepared a Draft Environmental Impact Statement (DEIS) for the proposal by Millennium Bulk Terminals-Longview LLC (MBTL) to construct and operate a coal export terminal along the Columbia River in the Longview area of Cowlitz County, WA (Longview coal port). Among the significant adverse impacts of that proposed Longview coal port discussed in the DEIS was the impact of the operation of that port on the release of greenhouse gases (GHG)[9] and the contribution that pollution would make to global warming.

These comments will focus exclusively on the DEIS's analysis of the carbon pollution associated with changes in the combustion of fossil fuels in the generation of electricity in Asia and the United States that results from the export of coal through the proposed Longview coal port.[10] In particular, we will not be commenting on the DEIS's analysis of the GHG emissions associated with the operation of the port and the shipping of the coal. The reason for the focus on fossil fuel combustion to generate electricity is, as pointed out in the DEIS, that: "*Greenhouse gas emissions outside of Cowlitz County during the operations attributable to the Proposed Action [permitting the proposed coal port] would be driven primarily by coal combustion in Asia and The United States*." [11]

1. The Carbon Pollution Conclusions of the Millennium Bulk Terminals-Longview SEPA Draft Environmental Impact Statement

The Longview DEIS concluded that the additional carbon pollution associated with the construction and operation of the proposed Longview coal port would be *adverse, significant, and permanent*:

[9] More specifically the DEIS discusses the CO_{2e} impact of the proposed Longview coal port

[10] We will focus on the GHG emissions associated with the *combustion* of coal and related natural gas usage. There are also GHG emissions associated with the operation of the port and the shipping of coal to Asian countries that the DEIS analyzed in some detail. We focus on the GHG emissions associated with the burning of the coal and related natural gas for two reasons. First, the GHG emissions from port operations and coal transportation are much smaller than the GHG emissions associated with the burning of the coal. Second, for transportation costs, it is the *difference* in the GHG emissions associated with coal being delivered to a coal-fired electric generator from alternative sources that matters. Most of the potential Asian markets for Longview coal are relatively remote from *all* coal sources. For that reason, the *differences* in transportation-related GHG emissions associated with alternative coal sources are likely to be small, especially compared to those associated with the burning of the coal. This is not to suggest that the GHG emissions associated with shipping coal very long distances are unimportant. We are simply focusing on the largest of the GHG impacts.

[11] DEIS p. S-38.

> *"Under the preferred 2015 Energy Policy scenario, the change in [carbon] emissions…from the Proposed Action [authorizing the Longview port] in 2028 would be 3.2 million metric tons of CO_{2e}. This is the equivalent to adding about 672,100 passenger cars on the road each year.*
>
> *The total net emissions for the preferred 2015 Energy Policy scenario from 2018 to 2038 would be 37.6 million metric tons of CO_{2e}….This would exceed various thresholds that are proposed in federal and state regulations and guidance. Since the net greenhouse gas emissions …would exceed these standards, the emissions are considered to be significant impacts. The climate change impacts…would persist for a long period of time….and would be considered permanent. The climate change impacts, while global in nature, would affect Washington State. Based on these considerations, emissions attributable to operations of [the proposed port]…are considered adverse and significant*."[12]

The DEIS concluded that the net additional 3.2 million metric tonnes of carbon pollution in 2028 associated with the preferred scenario, the 2015 Energy Policy scenario, would be *significant, adverse, and permanent.* Given that the net increase in carbon pollution under the Upper Bound scenario would be about almost 10 times larger, than the cited 3.2 million metric tons per year (MMtpy) of carbon pollution for the preferred scenario in 2028, clearly those this higher-impact scenario would have even more significant and adverse permanent impacts on climate stability. The DEIS expresses the 3.2 MMtpy of carbon pollution in 2028 as "*the equivalent to adding about 672,100 passenger cars on the road each year."*[13] The Upper Bound results would be the equivalent of adding about 6.6 ***million*** passenger cars.[14]

These carbon pollution emissions can be expressed instead in terms of the carbon pollution emissions associated with a typical coal-fired electric generator in the U.S. EPA estimates that each U.S. coal-fired electric generator emits, on average, 3.4 million metric tons of CO_{2e} per year. The average annual carbon emissions from 2025 through 2040 that the DEIS estimated for the 2015 Energy Policy scenario is the equivalent of a third of the emissions from an average American coal-fired electric generator. The average annual additional carbon pollution estimated by the DEIS for the Upper Bound and Cumulative scenarios during that time period

[12] Ibid. pp. S-38 and S-39.
[13] Ibid.
[14] The 2028 projections come from the DEIS p. 5.8-16, Table 5.8-8. There is a bit of "comparing apples to oranges" in the CO_{2e} emissions presented in the DEIS. The 3.2 million metric tonnes associated with the preferred (2015 Energy Policy) scenario is only for one year 2028. The cumulative CO_{2e} emissions over the 2018-2038 period in the quote above from the DEIS was reported as 37.6 million metric. That would be average annual carbon pollution emissions of about 1.8 million metric tons of CO_{2e}. The DEIS also reports on the average impact of the proposed port on the CO_{2e} emissions for the 2025 through 2040 period during which the Longview port would be operating at full capacity. The average annual emissions for that time period were 1.2 MMtpy for the preferred 2015 Energy Policy scenario. For the Upper Bound it was 29.8 MMtpy and for the Cumulative it was 43.4 MMtpy. **That is, the average GHG impacts of the Upper Bound and Cumulative scenarios were 24 and 35 times larger than the "preferred" scenario, respectively.**

would be the equivalent of 8.7 and 12.6 coal-fired electric generators, respectively.[15] Clearly the carbon pollution associated with the Upper Bound and Cumulative scenarios is very significant.

2. The DEIS's Approach to Analyzing Coal Markets: Taking into Account the Market Impacts of Competing Fuel Supplies for Electric Generation

Coal industry representatives have often dismissed concerns that building new west coast coal ports to facilitate the shipping of Powder River Basin (PRB) and other western coal to Asian Basin countries would boost the volume of carbon pollution. They have argued that when PRB coal is shipped to an Asian nation, it simply displaces the coal that that country would have otherwise obtained from its own coal deposits or purchased from other coal exporting nations. That is, the PRB coal would simply substitute for the equivalent amount of coal energy from other sources. When adjusted for different coals' energy contents, little or no extra carbon pollution would take place. This argument imagines the PRB coal is a perfect substitute for other sources of coal so that the consumption of coal energy and carbon emissions remain fixed despite the development of new sources of supply.

This industry claim has always been in conflict with what economics tells us about the interaction of supply and demand and the reaction of markets to changes in either supply or demand. The DEIS's coal modeling correctly did *not* make that assumption of perfect substitution. It recognized that coal is bought and sold in international and U.S. domestic markets in which supply and demand interact. When one aspect of that market setting changes, it triggers adjustments throughout energy markets until a new equilibrium is reached. After those market adjustments have been made, prices and quantities consumed are likely to be different than before the economic change disrupted the previous market equilibrium and triggered the adjustments to a new equilibrium.[16] Our previous work has supported this relationship and U.S. federal courts have also recognized those market relationships as important in analyzing the environmental impacts of changing coal supplies.[17]

The DEIS modeled the market adjustments that would be triggered by the construction and operation of the proposed Longview coal port. According to the DEIS, such an event would have the following market impacts, regardless of the scenario:[18]

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[15] See the previous footnote. Coal-fired power plant emissions for one year were estimated to be 3.8 million metric tonnes of CO_{2e} https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references.

[16] ICF presented a graphical depiction of these Asian and U.S. coal market adjustments on pp. 6-3 and 6-4 in the Coal Market Assessment Technical Report and pp. 3-15 and 3-16 of the SEPA Greenhouse Gas Emissions Technical Report.

[17] "The Impact of Powder River Basin Coal Exports on Global Greenhouse Gas Emissions," T.M. Power and Donovan S. Power, Power Consulting, Inc., May 2013, prepared for The Energy Foundation. For U.S. Federal Court decisions see: High Country Conservation Advocates v. U.S. Fores5t Serv., 52 F.3d 1174 (D. Colo. 2014 and High Country Conservation Advocates v. U.S. Forest Serv., 67 F.3d 1262 (D. Colo. 2014) Also see the U.S. Court of Appeals for the Eighth Circuit, No. 02-1359, Mid States Coalition for Progress v. Surface Transportation Board, October 2, 2003.

[18] DEIS p. 5-18-17.

- It would increase the supply of low cost coal to international markets.
- That increase in supply would decrease international coal prices.
- The decrease in international coal prices could increase the international consumption of coal energy.
- The increase in international demand for U.S. coal could increase U.S. coal costs.
- An increase in U.S. coal costs would reduce domestic coal energy consumption and increase the consumption of lower carbon U.S. natural gas and renewable electric energy sources.

To take all of these market reactions to the construction and operation of the proposed Longview coal port into account, the DEIS focuses separately on coal markets in the Asian Basin and coal and natural gas/renewable markets in the U.S.

In Asian nations the initial coal demand was assumed to be equal to the International Energy Agency's (IEA's) most recent projections of coal demand by nation. Then the impact of the introduction of 44 million metric tonnes per year of additional low cost coal supply from west coast coal ports on Asian coal prices was estimated given the policy and economic conditions assumed in each scenario. The DEIS used quantitative estimates of the sensitivity of Asian nation coal energy consumption to changes in the delivered cost of that coal to project how much more coal would be consumed because of the decline in the delivered cost of coal.[19] This *induced* increase in Asian coal energy consumption was then converted into increased carbon pollution emissions.[20] The increase in carbon pollution due to the export of coal to Asia through the Longview coal port was primarily tied to this type of induced demand in Asia due to the assumed lower delivered cost of coal from U.S. west coast supplies that successfully competed with existing coal supplies in Asian nations, forcing the cost of coal in Asia lower and encouraging a higher level of coal energy consumption there. This chain of adjustments is what we would expect as the result of the addition of an additional low cost source of coal supply to Pacific Basin markets.

The U.S. market adjustments after the Longview coal port begins operating are somewhat different. The increased demand for Western coal to serve the proposed Longview coal port is

[19] Economists measure the sensitivity of demand to changes in the cost or price of a commodity by using the ratio of the percentage change in quantity consumed to the percentage change in price. This measure of price sensitivity of consumption is called the *price elasticity of demand.* The DEIS obtained its measure of the price sensitivity of demand in Asian nations from the professional economic literature. It used three different estimates of price sensitivity depending on the scenario: -0.11, -0.4, and -1.2. This range of near zero to above 1.0 in absolute value certainly covers the range of estimates for the price elasticity of demand for coal. Given the long lived nature of a coal port and the 20-year analysis period used in the DEIS, long-run elasticities of demand should have been used in this analysis. That would eliminate the near zero value (-0.11). The -0.4 to -1.2 would be a reasonable range of values for long-run price elasticities of demand for coal.

[20] The analysis of the increased consumption of coal energy has to take into account the different energy content in different types of coal. The analysis cannot be carried out entirely in terms of metric tonnes of coal consumed since, if relatively low Btu coal is substituted for a higher Btu coal, more tonnes will have to be burned just to get the same useful energy. There may not be an increase in energy consumption, just the combustion of more tonnes of lower quality coal. Since carbon emissions are more or less proportional to the energy content of the coal, shifting to a lower Btu coal may increase the consumption of tonnes of coal while not impacting significantly the production of carbon pollution. The DEIS reported results almost exclusively in terms of metric tons of coal rather than Btu of coal energy making it difficult to identify when there were actual increases in coal energy consumption and, therefore, increases in carbon pollution.

assumed to push coal mines into areas that are more costly to mine. That means that the delivered cost of coal from Western coal mines will increase, making it a somewhat less attractive fuel for the generation of electricity in the U.S. Alternative sources of electricity would become more attractive. The primary alternatives are electricity from natural-gas-fueled generators and renewable electric energy sources. The *assumed* higher U.S. coal prices would lead to the use of less carbon-intensive sources of electricity. As a result, carbon pollution would fall even if the total amount of electricity consumed remained the same. This substitution of natural gas and renewables for coal in generating electricity in the U.S. would lead more natural gas to be consumed. That increase in carbon pollution from the burning of that fossil fuel has to be accounted for at the same time the reduction in carbon pollution from the decline in the use of coal is taken into account. *If* the mining of an additional 44 MMtpy of PRB coal would in fact significantly increase the cost of mining that coal, this is exactly the pattern of responses we would expect.

The DEIS takes all of these market adjustments in Asian and U.S. coal markets into account in estimating the net change in carbon pollution associated with the construction and operation of the Longview coal port. The size of these market adjustments within U.S. coal, natural gas, and renewable electric resources that the DEIS projects are not small. As the DEIS points out, the primary source of increased carbon pollution due to the operation of the Longview coal port is the induced increase in coal energy consumption in Asia due to the increase in a low cost source of coal supply from the proposed Longview coal port.[21] In the Upper Bound scenario, for instance, where the Longview coal exports induced additional consumption of coal energy in Asia, almost 38 million metric tonnes per year of additional carbon pollution would result from the induced coal energy consumption in the Pacific Basin, the equivalent of the carbon pollution from about 11 additional average sized coal-fired electric generators in the U.S.[22]

The steps taken in the DEIS to recognize that the consumption of coal was sensitive to the cost of delivered coal were appropriate and necessary. Changes in supply and demand trigger *changes* in prices and quantities produced and consumed that do not sum to zero except under very unusual circumstances. The DEIS took steps to incorporate the price elasticity of demand for coal in the Pacific Basin. The DEIS also recognized the importance of the cross price elasticity of demand between coal prices and natural gas consumption/renewables due to the competitive nature of these fuels for the generation of electricity within the U.S. Finally, the DEIS recognized the importance of the shape of coal supply curves when analyzing the market adjustments that are likely to be triggered when coal production is significantly increased. All of these were appropriate modeling steps in seeking to estimate the likely impacts of the proposed Longview coal port on coal production, coal and natural gas consumption, renewable electric generation deployment, coal movement in international coal markets, and the impacts of all of these on carbon pollution.

Although we find the DEIS's *conceptual economic approach* to be correct, later in these comments we will take issue with some of the *empirical assumptions* that the DEIS made in

[21] ICF Greenhouse Gas Emissions Technical Report, Table 47, p. 3-9.
[22] Op. cit. ICF Coal Market Assessment Technical Report, Table 72, p. 6-46. Note that this is the additional carbon pollution occurring in Asia without adjustment for any changes in carbon pollution in the U.S.

implementing this approach and, as a result, will reject some of the conclusions reached in the DEIS. In particular, we do not find empirical support for the assumption that a partial recovery of PRB coal mining to levels below recent past mining levels in the PRB, in order to supply the Longview coal port, would cause the cost of mining that coal to rise significantly. For that reason, we reject the DEIS's conclusion that there would be a significant decrease in coal consumption in the U.S. and its replacement with less carbon intensive sources of electricity due to the operation of the Longview coal port.

3. The DEIS's Scenario Approach to Analyzing the Impact of the Proposed Longview Coal Port on Carbon Pollution

The DEIS estimates the carbon pollution impacts of the proposed Longview coal port under five different "scenarios" that were meant to represent a variety of economic and regulatory environments. Those scenarios were intended to bracket the range of possible impacts of the proposed Longview coal port on carbon pollution emissions. Thus two of the scenarios used in the DEIS were labeled "Lower Bound" and "Upper Bound." Another DEIS scenario looked at recent past international coal market conditions and was labeled "Past Conditions (2014)". A fourth scenario attempted to reflect current regulatory and economic conditions and was labeled "2015 Energy Policy." This is the scenario that was the focus of the DEIS quote above. That 2015 Energy Policy scenario was labeled the "preferred" scenario by the DEIS. Finally, a scenario that considers the whole set of other proposed coal ports on the west coast in addition to the Longview coal port, a "Cumulative" scenario, was also considered.[23]

This set of DEIS scenarios *did* provide a broad range of carbon pollution outcomes that might be associated with the Longview coal port. Some projected carbon pollution increases associated with the Longview port were much larger than the DEIS's "preferred" scenario and some were much lower. For two of the DEIS scenarios, the Past Conditions and Lower Bound, the difference in net carbon pollution with and without the proposed coal port was estimated in the DEIS to be ***negative***. That is, the construction and operation of the Longview coal port was projected to ***reduce*** carbon pollution overall. We will discuss that result in detail later in these comments in Part IV. In two other scenarios, the Upper Bound and Cumulative, CO^2 pollution would increase, on net, by about 30 and 43 million metric tonnes per year, respectively. The scenario that the DEIS labels "preferred" in the DEIS, namely the 2015 Energy Policy scenario, projects only an additional 1.2 million metric tons per year in CO_{2e} between 2025 and 2040, about 4 and 3 percent of the carbon pollution from the Upper Bound and Cumulative scenarios, respectively. See Table 1 below.

[23] The Cumulative scenario is not just one of the five scenarios developed in the DEIS. Its purpose was to meet the requirement in an Environmental Impact Statement to analyze the impact of the proposed alternative in addition to other changes not directly associated with the proposed alternative that might also take place simultaneous with the proposed alternative. For that reason it is modeled somewhat differently and is not easily compared to the other four scenarios.

Table 1.

Average Net Impacts of the Longview Coal Port on CO_2 Emissions, 2025-2040 Average (Thousands of Metric Tonnes per Year)	
Scenario	**CO_2 Emissions**
Past Conditions (2014)	**-2,551**
Lower Bound	**-2,259**
Upper Bound	**29,792**
2015 Energy Policy	**1,224**
Cumulative	**43,423**
Source: Coal Market Assessment Technical Report	
Tables 40, 56, 72, 88, 104	

Providing as broad a range of scenarios as possible does not necessarily provide more relevant information about the likely impact of the proposed coal port. We assume that the DEIS was intended to disclose the likely environmental impacts of a *commercially successful coal port* at Longview. If the assumptions associated with some possible scenarios are not consistent with a commercially successful Longview coal port, those scenarios cannot provide any relevant information about the environmental impact of the operation of the port. The port simply will not operate and there will be no impacts on coal markets either in the U.S. or in the Pacific Basin. For the operation of the proposed Longview coal port to have any relevant environmental impacts, it has to actually operate. That means that it must provide coal to the Asian Basin that can successfully compete with the coal sources that otherwise would serve those nations and capture a share of those markets while also being profitable to the coal mines and coal ports in the Western U.S.

The DEIS is skeptical about the commercial marketability of coal shipped through the proposed Longview coal port to Pacific Basin coal markets. Part IV below discusses the competitiveness of Longview coal under the various scenarios in detail.

Of the DEIS's "preferred" scenario, the 2015 Energy Policy scenario, the DEIS says: "*Under the 2015 Energy Policy Scenario the growth in demand in countries in Asia would be only 0.8%, which would be a challenging market environment for coal transported through the [Longview] terminal*."[24] The DEIS also points out that in this scenario "*the amount of induced demand is only about 0.45 million metric tons [per year of coal*]" averaged over the 2025 to 2040 period.[25] That is, despite 44 MMtpy of coal being exported to Asia each year through the Longview port, only one percent of this volume of coal serves addition induced consumption of coal energy. All the rest of that exported coal just displaces other coal that would have been burned. The impact of these exports on the delivered cost of coal in Asia is near zero. The price is barely any different from the price that Asian nations would otherwise have paid. Put slightly different, the

[24] ICF, Coal Market Assessment Technical Report, p. 6-50.
[25] Ibid. p. 6-51.

Longview port coal exports barely price into Asian markets under the DEIS's "preferred scenario."

The DEIS is also skeptical about the competitiveness of Longview coal exports under the Past Conditions (2014) scenario. The DEIS points out that shipping coal from the Pacific Northwest to Asia will cost $2.9 per million Btu, but current Asian coal costs are about $2.5 per million Btu. "*Delivered prices to Japan in the range of $3.00 per million Btu suggest that PRB coal would have a difficult time being cost-competitive, if shipped through the PNW to Japan or other Pacific Basin countries* ***until international coal prices increase***" (emphasis added).[26] The Cumulative scenario was also based on those Past Conditions (2014).

Finally, the DEIS's Lower Bound scenario was designed to describe a situation where Longview coal would not really be competitive in Asia and, even if it was, there would be no induced demand for coal energy because the assumed price elasticity of demand was assumed to be almost zero (-0.1). The DEIS explicitly states that under the Lower Bound scenario the price change "*does not induce* [any coal] *demand in Asia*."[27] The DEIS also is explicit about its doubts as to whether Longview coal could compete in Asia under the Lower Bound Scenario: "*In the Lower Bound Scenario the growth in coal demand in Asia would be only 0.9% and, with the lower international coal prices, would be a challenging market environment for coal transported through the [Longview] terminal*"[28] The DEIS is projecting that there would be no delivered cost advantage of Longview coal in Asia under the Lower Bound scenario.

Our analysis of the Asian coal markets conditions presented below in Part III and Appendices A and B came to the same conclusion as the DEIS: Under current and foreseeable Asian market conditions Western coal would not be competitive in Pacific Basin nations. Of course, the demand for coal in Asia and the market prices being paid for imported coal supplies could rise. Pacific Basin coal markets could move back towards the "boom" conditions that existed in the 2008-2013 time period when the Longview and other new and expanded west coast coal ports were first proposed. But that is *not* what the DEIS modeled in four of its five scenarios. In that sense, the DEIS did not focus its analysis on scenarios that were relevant to the question of what the impact of a commercially viable Longview coal port would be on carbon pollution.

4. The Only Clearly Competitive Market Scenario for the Longview Coal Port Analyzed by the DEIS

The DEIS specifically designed one of its scenarios to "*provide for a robust market environment for coal transported through the [Longview coal] terminal*."[29] That is, that scenario sought to assure that market conditions for Western coal in the Pacific Basin would clearly support the full utilization of the Longview coal port's capacity. For that to be certain, significantly improved market conditions were assumed. As the DEIS described the "Upper Bound" scenario:

[26] Ibid. pp. 3-8 and 3-9.
[27] ICF Greenhouse Gas Technical Report, p. 3-8.
[28] Op. cit. Coal Market Assessment Technical Report, p. 6-26.
[29] Ibid. p. 6-38.

> "*The world energy outlook under the Upper Bound Scenario could be described as a high coal demand scenario, where coal plant construction, and thus, coal demand, is higher…Thus, both international coal consumption and prices would increase*."[30]

To create this robust market for Longview coal, international coal prices were increased by 50 percent and the rate of growth of Asian coal demand was also increased 50 percent relative to the Past Conditions (2014) scenario. In the domestic U.S. coal market, Western coal prices were assumed to decline 10 percent and coal transportation costs to the Longview terminal were reduced by 20 percent. Both of those changes would make Longview coal more competitive in Asian markets.[31]

Given that under existing international coal market conditions the Longview coal would not be competitive (See Part III and Appendices A and B below), in order to model the impact of a commercially viable Longview coal port, it is necessary to *assume* improved market conditions. Market conditions have to be assumed that would justify the construction and continuous operation of the coal port at its full capacity for its projected life. Otherwise the Longview port will not be built and operated and there will be no carbon pollution impacts to analyze.

What the DEIS labels the Upper Bound scenario is the only scenario that the DEIS models that actually supports a commercially viable Longview coal port. That scenario should be relabeled the "Commercially Feasible Longview Port" scenario and used to indicate the likely impact associated with the Longview Port operating at full design capacity for its modeled commercial life. This should be the "preferred" scenario because it is the only scenario modeled in the DEIS that unambiguously supports a commercially viable Longview coal port.

The DEIS estimates the induced demand associated with a "robust" Pacific Basin market for the Longview coal exports would result in a net annual increase in carbon pollution of almost 30 MMtpy of CO_{2e} averaged over the 2025 to 2040 period.[32] This is 24 times the level of carbon pollution that the DEIS calculates would results from the operation of the Longview port under the DEIS's "preferred" scenario, the 2015 Energy Policy scenario. As pointed out above, the DEIS found that such a Commercially Feasible Longview Port would be responsible for carbon pollution, net of changes in U.S. energy markets, that was the equivalent of the emissions of about 9 coal-fired electric generating plants. The DEIS concludes that its "preferred" scenario would be responsible for carbon pollution that was the equivalent of one-third of the emissions of an average U.S. coal-electric generator averaged across the same time period, 2025-2040.[33]

[30] Ibid. p. 5-4
[31] Ibid.
[32] Ibid. Table 72.
[33] See footnote 10 above for a discussion of the different levels of carbon pollution that the DEIS reports for the "preferred" 2015 Energy Policy scenario depending on the model year or the years over which the level of carbon pollution was averaged.

5. The DEIS Estimate of the Carbon Pollution Associated with a "Commercially Feasible Longview Port" (Upper Bound) Is an Underestimate.

To serve the Longview coal port, Western coal mining has to increase 44 million metric tonnes per year. In the DEIS, it is assumed that producing that amount of addition coal would require going after somewhat more costly coal, which would raise the cost of PRB coal as a whole. The assumed higher PRB coal cost would, in turn, increase the overall cost of coal in domestic U.S. coal markets. This assumed higher cost of coal would lead to a decline in U.S. coal energy use and a decline in carbon pollution from U.S. coal consumption, which would be replaced with a lower carbon fuel in electric generation (natural gas) or zero carbon electric generation from renewable electric generation. The DEIS projected the net result of this increased PRB coal mining to serve the Longview port would be a decline in carbon pollution associated with U.S. electric generation. The DEIS projected *decline* in U.S. carbon pollution due to the operation of the Longview port was significant.

For what we have called the Commercially Feasible Longview Port (Upper Bound) scenario the reduction in carbon pollution, on average over the 2025-2040 period, would be 10 million metric tonnes of $C0_2$ per year. That represents a 27 percent offset of the increased Asian carbon emissions due to the induced increased consumption of coal energy. Some of the decline in U.S. coal energy consumption would be due to the substitution of natural gas for coal in the fueling of electric generation in the U.S. The carbon pollution from the burning of that natural gas offsets 22 percent of the carbon pollution reduction due to reduced American consumption of coal energy. On net, the impact of the increased demand for Western coal to serve Asian markets is estimated by the DEIS to offset about a fifth of the increased carbon pollution induced in Asia by the Longview coal port. See Table 2.

Table 2.

Average Impacts of the Longview Coal Port on CO_2 Emissions Upper Bound Scenario: 2025-2040 Average (Millions of Metric Tonnes per Year)		
Source of CO_2 Emissions Increase	**CO_2 Emissions**	**% of Asian Increase**
Pacific Basin: Induced Additional Coal Energy Use	37.6	100%
U.S. Coal Energy Use	-10.0	-27%
U.S. Natural Gas Use	2.2	6%
Net U.S. Emission Change	-7.8	-21%
Total Change	29.8	79%
Source: ICF Coal Market Assessment Technical Report, Table 72, p. 6-46.		

The key assumption the DEIS makes in deriving this reduction in carbon pollution in the U.S. due to the operation of the Longview port is that a 44 MMtpy increase in PRB coal mining will drive the cost of mining that coal significantly upward. As discussed in detail in Part V of these comments, given the current level of coal mining in the PRB and the level of PRB coal mining

projected by the DEIS, an increase in PRB coal mining of 44 MMtpy would not represent an *expansion* of coal mining in the PRB but, rather, a return to previous levels of mining that had been carried out without previously driving coal mining costs upward.

In 2014, the PRB produced 418 million short tons (379 MMtpy) of coal. This was a drop in production of 78 million short tons (71 MMtpy) or about 16% of peak 2008 production.[34] In constant 2014 dollars, the price of a short ton of coal in 2008 was $11.68 and in 2014 it was $11.99.[35] Clearly the cost of coal did not vary much as production increases or decrease in the PRB over the range of 400 to 500 million short tons per year. Coal production in the PRB has declined almost every year since 2008.[36] Because of looming regulations like the Clean Power Plan and the growing deployment of lower carbon sources of electricity such as renewables and natural gas fired generation, PRB coal production has been in decline since 2008 and may continue to face declining demand.

In this setting, the demand that the Longview coal port would place on PRB coal mines would simply move production in the PRB partially back towards where PRB mines previously operated. In addition, the coal with the lowest cost access to the Longview port is Montana PRB coal that has not been mined as heavily as the southern PRB in Wyoming because the Montana coal faced higher transportation costs to reach most U.S. electric generators.

The DEIS projects that under what we have labeled the Commercially Feasible Longview Port (Upper Bound) scenario, the average PRB coal mining for the 2025-2040 period would be 435 MMtpy.[37] Even under the DEIS's cumulative scenario when 100 MMtpy more tons of coal would be exported from the west coast, the DEIS projects the average annual mining level in the PRB to be 390 MMtpy. [38] Clearly the DEIS does not expect, even under its "upper bound" scenario, to reach the previous level of mining in the PRB of about 450 MMtpy.

It should also be kept in mind that the mine mouth cost of PRB coal represents only a fraction of the delivered cost of that coal to electric generators in the U.S. For the years 2009 to 2014, on average, the PRB mine mouth price of coal was 36 percent of the delivered price of coal to electric generators.[39] That means that a 10 percent increase in PRB coal mining costs would raise the delivered cost of the coal only 3.6 percent. Thus, for the very low production cost PRB coal, changes in mining costs get diluted by the relatively high transportation costs to move the coal to eastern and southern population centers and, therefore, have a smaller impact on coal consumption.

Finally, if the PRB coal supply curve information that the DEIS said was used to estimate the impact of increased coal mining to serve the Longview coal port is used to put together a "merit

[34] EIA. Coal Data Browser. Total US surface mine production by basin. http://www.eia.gov/beta/coal/data/browser
[35] http://www.eia.gov/beta/coal/data/browser/#/topic/33?agg=0
[36] There was a small increase in production from 2009 to 2010 of a little more than 12 million short tons.
[37] Op. cit. ICF Coal Market Assessment Technical Report, Table 58, p. 6-37.
[38] Ibid. Table 90, p. 6-60.
[39] Both costs expressed in constant 2014 dollars. U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report." Table 2, "Real average annual coal transportation costs by primary transport mode and supply regions." Mine mouth spot prices used for the mine mouth costs. They come from the EIA Coal Markets reports on average weekly coal commodity spot prices. http://www.eia.gov/coal/markets/

order" coal supply curve for the PRB showing the least expensive sources of supply as the coal mining level increases, those coal supply curves clearly show a very flat cost curve between 300 and 500 MMtpy, a production range that the DEIS concludes the demand for PRB coal will not exceed. See Part V below.

If serving the Longview coal port does not require an increase in the level of PRB coal mining beyond that which it has experienced in recent years, it is not clear that coal mining costs would rise significantly since production will not have actually increased over recent past levels. This makes the DEIS's significant off-setting declines in U.S. carbon pollution due to reduced use of coal to generate electricity in the U.S. questionable. If those U.S. offsets to increased carbon pollution in Asia are not included in the Commercially Feasible Longview Port scenario, the estimated carbon pollution impact of the Longview port would be higher.

As shown in Table 2 above the DEIS reduced the carbon pollution associated with the Commercially Feasible Longview Port scenario by 7.8 MMtpy of CO_{2e}. If that U.S. carbon "off set" were to be eliminated, then the actual carbon pollution impact of a commercially feasible Longview coal port would be 37.6 MMtpy of CO_{2e} rather than the 29.8 MMtpy estimate provided by the DEIS. That increases the carbon equivalence of the proposed Longview coal port from the emissions of 8.7 average U.S. coal-fired electric generators to about 11 such coal-fired generators. As the DEIS concludes, that level of increased carbon pollution would represent a very large and permanent adverse impact.

Part II: "Forcing" Coal Exports through the Proposed Longview Coal Port Regardless of Their Competitiveness in Pacific Basin Coal Markets

1. A brief explanation of the modeling performed for the DEIS

In their assessment of the proposed Longview coal port, Ecology hired ICF International (originally Inner City Fund) to model the economic viability and emissions impact of the port. ICF used their proprietary energy economy model called the Integrated Planning Model (IPM) in this assessment. The IPM is a proprietary model developed by ICF to support government and industry analysis of the U.S. and global power sector. The IPM constructs a sophisticated representation of the supply side of the energy economy[40] for the United States with international fuel trading also considered. It incorporates representations of fuel extraction, transportation, and different sources of electrical generation into the model. IPM is used by 18

[40] The term energy economy encompasses all of the portions of the economy that relate to the generation or consumption of energy. The energy economy can be divided into two separate categories: the supply side of the energy economy and the demand side of the energy economy. The supply side encompasses all parts of the energy economy that are involved with the production and distribution of energy including extraction (i.e. coal mining, oil extraction, natural gas extraction, etc.), generation, and distribution of both physical commodities such as coal and oil as well as transmission of electricity. The demand side of the energy economy encompasses all parts of the energy economy that are involved with the consumption of energy including direct fuel consumption (i.e. fuel used in electric generation and transportation or gas used in heating, etc.) as well as the consumption of electricity by the residential, commercial, and industrial sectors.

private sector entities,[41] all of which are energy generation/transmission corporations, and at least 5 public sector entities.[42] The IPM has also been used quite recently to look at coal flows, energy market impacts, and GHG impacts from a proposed coal mine in Colorado by the U.S. Forest Service in their supplemental DEIS for the Colorado Roadless Rule.[43]

Publicly available documentation of the IPM is limited; the most thorough publicly available description of the model is published by the U.S. Environmental Protection Agency (EPA). The EPA uses the IPM in analysis of regulations and legislative proposals.[44] The IPM works well for these analyses because the IPM represents the supply side of the energy economy (in the United States) with a relatively high degree of geographic detail. This high degree of geographic detail results in a precise analysis of the effects that federal as well as local regulations may have on factors within the energy economy such as the price of energy or the mix of energy sources needed to meet a specified amount of demand. There are an infinite number of possible, mathematically correct solutions to the problem of calculating a mixture of energy generation and transmission methods to meet a certain electrical demand.[45] In order for the IPM to be useful, some measure of the 'best' answer must be determined. The measure of the 'best' answer used by the IPM, then, is the mix of energy generation and transmission that meets a constant electrical demand at *the lowest total cost* while adhering to physical and regulatory limits. The IPM uses linear programming (LP) solvers to determine the lowest cost solution for each set of physical and regulatory limits that are input to the model.[46] These physical and regulatory limits are incorporated into the model as constraints and rules which can be adjusted to represent different regulatory scenarios. The ability to represent different regulatory scenarios allows the EPA to use the IPM to assess the possible impact that the different scenarios may have on the economy and the environment over a certain time period.

In every Proposed Action of every scenario, constraints are placed on the model to use the full export capacity of the proposed Longview coal port. This is an unreasonable constraint to put on the model since market interactions would dictate the level of coal that would be shipped through the coal port. This is a problem that needs to be corrected in the final EIS. However, there *are* examples in the DEIS of different types of reasonable constraints applied to the modeling of the Longview coal port. For example, the DEIS states:

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[41] Private sector users include PEPCO, Entergy, Exelon, Tucson Electric Power, Florida Power and Light (FPL), Dominion, NRG, Delmarva Power, Southwestern Electric Power Company, Calpine, APS, Duke Energy, American Electric Power, Otter Tail Power Company, Xcel Energy, Dogwood Energy, Peabody Energy, and Dynegy.

[42] Public sector users include U.S. Environmental Protection Agency, State public service commissions, Environment Canada, the European Union, and the Natural Resources Defense Council.

[43] http://www.fs.usda.gov/roadmain/roadless/coloradoroadlessrules

[44] EPA Power Sector Modeling web page accessed on 9/9/15 at: http://www.epa.gov/powersectormodeling/ . Starting 10/1/15 the page will be hosted at: http://www.epa.gov/airmarkets/powersectormodeling.html.

[45] A simplified example of the infinite number of solutions to a problem can be shown with the equation: x + y = 10; x could be 8 and y could be 2 or x could be 7.99 and y could be 0.01. Both solutions are mathematically correct, but the 'best' answer cannot be determined without more information.

[46] An example of a linear problem is 'How many coins are needed to equal a dollar?' This problem has many solutions. If we define the 'best' answer as the least number of coins needed to equal a dollar, the answer is one (1 silver dollar). However, if we constrain this problem by requiring one of the coins to be a nickel, we need five coins (1 nickel, 2 dimes, 1 quarter, and 1 half dollar). This is a linear problem because there are multiple linear equations that can define the problem (1 dollar = A silver dollars + B half dollars + C quarters + D dimes + E nickels + F pennies; 1 dollar = 100 cents; 1 silver dollar = 100 cents; 1 half dollar = 50 cents; 1 quarter = 25 cents; etc.). Linear programming solvers, like the one used in the IPM model, can solve linear problems on large scales (millions of parameters).

> *"To ensure that the model does not send more subbituminous coal to these countries [Japan, South Korea, Taiwan, and Hong Kong] than they can use, constraints were added to limit the amount of subbituminous coal to no more than 30% of the country's total coal demand in TBtu."* [47]

The EPA documentation of the IPM also describes many types of constraints which are applied in their modeling of regulatory impacts. These constraints include rules for the distribution of coal, where new coal-fired generators can be added to the model, as well as rules that limit the emissions from various generators.[48] These constraints are important for modeling realistic scenarios as part of the government regulatory decision procedure. However, it is important to understand that the IPM is a *tool* which will calculate the least cost solution over the entire modeled time period for whatever constraints that are applied. This means that if a non-realistic constraint is applied to the model, it will still output a result but that result will also be non-realistic.

2. Scenarios That "Force" Exports to Asia through Longview Are Not Informative

The approach to modeling the impact of the Longview coal port that the DEIS used does not provide informative analysis of the likely impacts to energy markets and carbon emissions because the modeling is largely conducted for scenarios that are inconsistent with a commercially viable Longview coal port. For example, in the Lower Bound scenario, the delivered price of coal to the Asian market (Japan) from the proposed port are so high compared to their international competitors that the project would not be viable, and hence would never be built. Such scenarios are irrelevant to an actual evaluation of the impacts of the proposed Longview coal port. Clearly, a commercially non-viable coal port will have no impact because it will not be built or, if it is built, it will not operate.

Useful modeling of the impact of the proposed Longview coal port has to assume economic conditions that make that proposed port commercially feasible. Only one of the DEIS scenarios obviously meets that important criteria, the Upper Bound scenario. That scenario sought to create a market setting that "*would provide for a robust market environment for coal transported through the [Longview] terminal*."[49] It assumes that international coal prices will rise 50 percent, moving them back up towards where they were in 2010-2011 when the Longview and other west coast coal ports were first proposed.[50] To support those higher Asian coal prices the Upper Bound scenario assumes that the rate of growth of coal demand in Asian nations will also increase by 50 percent.[51]

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[47] Ibid. p. 4-12
[48] Documentation for EPA Base Case v.5.13 using the Integrated Planning Model. EPA # 450R13002. November, 2013 http://www.epa.gov/airmarkets/documents/ipm/Documentation.pdf
[49] Ibid. p. 6-38.
[50] Ibid. P. 3-8, Figure14 of the ICF Coal Market Report shows the rise in Pacific Basin steam coal index prices during 2009 and 2010, reaching a peak of about five dollars per million Btu in early 2011 before beginning the decline to about $2.5 per million Btu at the beginning of 2015. These are FOB prices that do not include the cost of delivering the coal to particular Asian nations from these coal ports.
[51] Ibid. Table 23, p. 5-2. For Asian countries that have seen declining demand, the decline was assumed to stop.

The scenario that the DEIS labeled "Upper Bound" is the only scenario considered in which the Longview coal port is obviously commercially feasible and actually could ship coal at its full capacity to Asian nations.[52] It is also the only scenario that could possibly have significant carbon emissions associated with changes in coal consumption associated with the construction and operation of the Longview coal port (for a more full discussion of this please see section IV). Because they are not obviously consistent with a commercially feasible Longview coal ports[53], the other scenarios provide no substantive information on the carbon emissions associated with the actual operation of the proposed Longview coal port. In particular, the low emissions associated with "Past Conditions (2014), "Lower Bound," and "2015 Energy Policy" do not provide any substantive information on the emissions associated with the operation of a commercially viable Longview coal port. They provide information on an unusual and unlikely situation where there is no justifiable demand for the Longview coal, but that coal is forced on the Pacific Basin anyway and parts of Asia are forced to accept higher cost coal than they would otherwise use in at least some of the modeled years. In addition, what is labeled the "Upper Bound" is actually an effort to create at least one scenario where the Longview coal port is actually obviously commercially viable. It is a scenario in which Longview coal exports would lower the price of coal delivered to Asia and, therefore, potentially stimulate additional coal consumption in Btu terms.

In modeling the expected GHG impacts of the proposed Longview coal port, it is crucial that at least one of the scenarios be consistent with that proposed port actually being commercially viable, otherwise we know what the impact of the port will be without doing any modeling: It will have no impact on coal markets because it will export no coal. The appropriate label for such a scenario would be "commercial operation" or "commercially feasible," not "upper bound." Since that was ultimately the purpose of the modeling. If the DEIS intended to show a range of impacts of the Longview port, it should have provided a range of impacts for different market conditions where the proposed Longview coal port would have been competitive within Asian markets. In doing so, it could have described the market conditions that would make the Longview port commercially viable and capable, therefore, of impacting Asian coal markets. The correct modeling of the proposed Longview coal port would have allowed the model to determine when and if and under what circumstances the proposed Longview coal port would have been commercially feasible. Then the plausibility of those conditions occurring could be evaluated and the impact of the commercially viable coal port on other coal markets and GHG emissions could have been calculated.

As a result, we are left with only one scenario that is consistent with a commercially viable Longview port. It should be labeled as such not as an "Upper Bound." We do not know if it is an upper bound since a range of commercially feasible Longview export levels was not modeled. What we do know is that this is the one set of economic conditions modeled by the DEIS where

[52] Using induced demand as a basic "litmus test" for commercial viability shows that this scenario is the only scenario that actually induces a significant volume of coal.

[53] We say obviously competitive because the full productive capacity of the port is a constraint in the modeling and there is little or no induced coal in these scenarios. Because there is little or no induced coal there is also little or no price advantage. Because the PRB is dramatically farther away from the intended markets in Asia with respect to its international competitors, very small changes in the shipping costs (ship hiring costs and diesel fuel costs) would very quickly make any advantages disappear. For a more complete description see appendix A.

the Longview port is operating on a commercial basis providing the only impact information that is relevant to the DEIS's line of analysis.

Part III: Change in Coal Market Condition since the Coal "Boom-Times" When the West Coast Coal Ports Were First Proposed.

1. The "Coal Boom Times" that led to the proposed Longview and a half-dozen other coal ports.

In 2008, China switched from being the world's largest coal exporter to being the world's largest coal importer. There were a number of factors that led China to import coal, but the end result was that China flipped the export market on its head as it shifted from a net exporter to a net importer. The price of steam coal shot through the roof.[54] This change in behavior from the world's largest coal consumer led many people to speculate that Chinese coal consumption was outstripping its coal reserves and as a result coal was entering a new "super cycle" that would see the expansion of coal ports on the west coast of the U.S. and massive new investment in the PRB coal production to fuel Asia's (driven by China's) growing demand.[55] Financial analysts in the middle of 2013 were urging people to heavily invest in the big PRB players including Peabody, Arch, Alpha Natural Resources, and Cloud Peal Energy. Currently Peabody, Arch, and Alpha have all filed for bankruptcy,[56]and Cloud Peak is currently paying the Vancouver, BC, coal terminal with which it contracted *not* to ship its coal to Asia.[57]

All of the big players in the PRB heavily invested in a future where they believed Asia had an almost unlimited appetite for foreign coal imports. The largest American coal companies doubled down on their international and domestic investments and then China dramatically reduced its imports of coal and dramatically downgraded their long-term forecasted use of imported coal.[58] There were a myriad of reasons that China stopped importing vast amounts of

[54] Morse, R. and He, G. The World's Greatest Coal Arbitrage: China's Coal Import Behavior and Implications for the Global Coal Market. Program on Energy and Sustainable Development. Working Paper #94. August 2010. http://iis-db.stanford.edu/pubs/22966/WP_94_Morse_He_Greatest_Coal_Arbitrage_5Aug2010.pdf and Cornot-Gandolphe, S. China's Coal Market: Can Beijing Tame 'King Coal'? The Oxford Institute for Energy Studies. December 2014. https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/12/CL-1.pdf

[55] Stone Fox Capital. Is the Coal Supercycle Back? *Seeking Alpha*. 4.20.2013. http://seekingalpha.com/article/1356091-is-the-coal-supercycle-back

[56] "Peabody, world's top private coal miner, files for bankruptcy," *St. Louis Post-Dispatch,* April 13, 2016. http://www.stltoday.com/business/local/peabody-world-s-top-private-coal-miner-files-for-bankruptcy/article_e8155c17-3d7c-5f5d-89b8-d15daed5e415.html Stewart, J. King Coal, Long Besieged, Is Deposed by the Market. *New York Times.* 8.6.2015. http://www.nytimes.com/2015/08/07/business/energy-environment/coal-industry-wobbles-as-market-forces-slug-away.html?rref=collection%2Ftimestopic%2FAlpha%20Natural%20Resources%20Inc.&action=click&contentCollection=business&region=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection&_r=0 and Miller, J. Arch Coal Files for Bankruptcy. *The Wall Street Journal*. 1.11.2016. http://www.wsj.com/articles/arch-coal-files-for-bankruptcy-1452500976

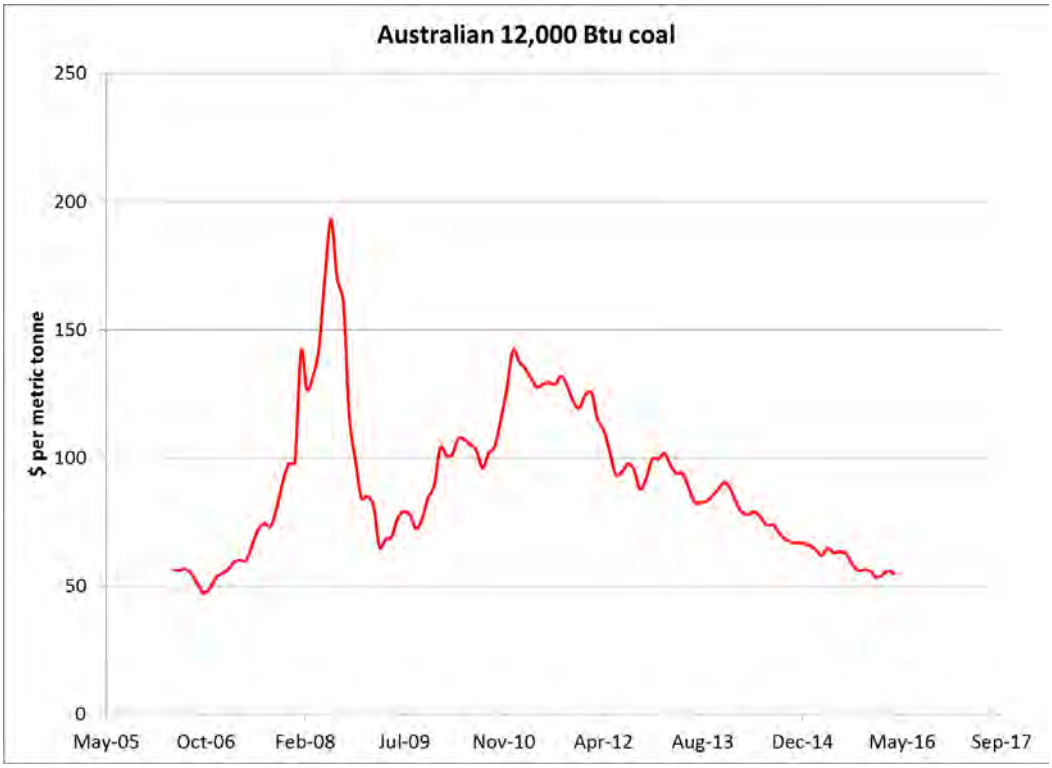
[57] For a more complete discussion see appendix A. Cloud Peak is currently locked in to a "pay of ship" contract with Westshore terminal in Vancouver.

[58] Sussams, L. China's 13th Five Year Plan offers no hope for coal markets, further suppressing CO2 emissions. *Carbon Tracker*. http://www.carbontracker.org/china-five-year-plan-coal-co2-emissions-renewables/ and Sligsohn, A. How China's 13th Five-Year Plan Addresses Energy and the Environment. *ChinaFile.* 3.10.2016. https://www.chinafile.com/reporting-opinion/environment/how-chinas-13th-five-year-plan-addresses-energy-and-

coal, but the simple version is that China cleaned up both their supply bottlenecks for their domestic coal production and softened their reliance on coal for electric generation going forward due largely to internal pressure stemming from their abysmal air pollution. At the same time, other major foreign producers (Indonesia and Australia) that are staple suppliers of coal to the Asian markets had some short run production issues that helped cause the price of thermal coal on the international market to skyrocket. This "perfect storm" led to coal port proposals in the Pacific Northwest and massive investments in Australia which are currently dramatically behind their target service dates and mired in financial difficulties.[59]

The price of benchmark indexes has gone from a high of almost $200 per metric tonne for Australian 12,000 Btu coal (or a $/million Btu price of about $7.29) in 2008 to the current price of about $50 per metric tonne (or a $/million Btu price of less than $2.50).[60] Figure 1 shows the Australian benchmark coal price series. As will be discussed in more detail later, when the benchmark price was highest, there was a large potential profit margin for U.S. coal if there had been ports to move the coal from the west coast of the U.S. to Asia.

Figure 1.



environment and CCTV. China 13th Five-Year Plan ep.7: Deepening energy revolution. CCTV. 5.7.2016. http://english.cctv.com/2016/05/07/VIDEnQT9GuhFdCVIMGHRmNDM160507.shtml

[59] Slezak, M. Australian coal mines are one of the riskiest investments in the world-report. *The Guardian*. 1.27.2016. http://www.theguardian.com/environment/2016/jan/28/australian-coalmines-are-one-of-riskiest-investments-in-the-world-report and Molyneaux, L. The case for Australian coal in India is weakening. *The Conversation.* 6.24.2015. http://theconversation.com/the-case-for-australian-coal-in-india-is-weakening-43694 and IEEFA. Galilee Coal Basin: Carmichael- A Stranded Asset? IEEFA. May 2015. http://ieefa.org/wp-content/uploads/2015/05/IEEFA-key-points-Adani-in-Galilee.pdf Much of Peabody's $10.1 billion in debt was incurred for an expansion into Australia. Op. cit. *St. Louis Post-Dispatch*, April 13, 2016.

[60] http://www.indexmundi.com/commodities/?commodity=coal-australian&months=120

Source: Indexmundi Australian thermal coal, 12000- Btu/pound, less than 1% sulfur, 14% ash, FOB Newcastle/Port Kembla, US Dollars per Metric Ton.
http://www.indexmundi.com/commodities/?commodity=coal-australian&months=120

Since (1) there was not enough port capacity to move U.S. coal (specifically PRB coal) to Asian markets, (2) China had put a great pressure on the demand side of international coal exports, and (3) relatively short run supply bottlenecks in Australia, Indonesia, and China, the price of thermal coal went through two "boom and bust" cycles between 2008 and 2011. Since mid-2011 the price of thermal coal on the international market has been declining. Unfortunately for the U.S. coal port proposals, ports take time to build and they were not able to capitalize on the extremely high demand (and prices) for thermal coal during the periods of peak Asian coal prices.

This leads us to the situation that we are in now. As will be shown in section III.5 of these comments, even though the PRB can price into Asian markets at what appears to be a historically unthinkably low price[61], it still cannot price into the Asian markets that are closest to it (Japan) and it will likely not be able to price into the Asian markets at any time in the reasonably foreseeable future. To understand why we have come to that conclusion, we now turn to a brief overview of the different Asian markets for thermal coal.

2. Changes in Asian coal markets

China

China dominates Asian coal markets. Although the distance to get PRB coal to China is greater than to either Japan or South Korea, if China decides to import coal, it dramatically moves the needle on global thermal coal prices. Because of a series of cascading events including the reorganization of the Chinese coal market, a need for the Chinese to ship their coal from the north and northwest to the energy using southeast, and government controlled energy pricing schemes, China's domestic coal production, beginning in 2005, was temporarily not sufficient to meet domestic coal demand. This void was filled by reduced exports and increased imports and China switched from being a net coal exporting country to a significant net importer of coal. That caused a sudden massive spike in the world benchmark coal price indexes.[62]

At the same time, U.S. coal consumption was flagging. This was in part because of low natural gas prices and concerns over the impact of the GHG and other toxic emissions associated with coal fired generation. This led American coal producers to look even more eagerly at potential Chinese and other Asian coal markets to make up for falling coal demand in the U.S. With China's second about face in 2014, reducing its coal imports, the U.S. coal industry was left

[61] This price is historically low because the cost of diesel fuel for U.S. rail and ocean going shipments are tied to the price of oil which is historically low. As China slowed its need for dry bulk ocean going shipments as well as coal (which use the same ships) there was a large oversupply of dry bulk freighters available which has dramatically lowered the ship hiring costs. Together this allows PRB coal to theoretically price into Asian markets at a historically low price and yet PRB coal still cannot price into Asian markets for reasons that will be discussed below.
[62] Oster, S. China Spurs Coal-Price Surge: Once-Huge Exporter Now Drains Supply, Repeat of Oil's Rise?. The Wall Street Journal. 2.12.2008. http://www.wsj.com/articles/SB120275985736359763

trying to pencil out the possible gains and losses of new coal mine and coal port proposals that now have much smaller profit margins.

China uses massive volumes of coal to produce electricity. In 2014, China produced 3.75 billion metric tonnes of coal with 3.18 billion metric tonnes being steam coal.[63] The next largest producer of steam coal is the U.S. who produced 0.916 billion metric tonnes of coal in 2014.[64] China is committed to lowering its coal consumption and reduced its total consumption 3.7 percent in 2015 compared to 2014 levels and 2.9 percent in 2014 compared to 2013.[65] This is significant because at the peak of China's importation of coal (in 2013), China was importing 0.252 billion metric tonnes of coal.[66] In other words China imported about 7 percent of the steam coal that it used for electrical generation. By cutting its coal consumption in 2014 and 2015 China *could* have already made imports unnecessary. The key with China is that it is actively and effectively cutting its steam coal consumption and is no longer looking to rely heavily on the international steam coal market.

As we will discuss in detail later, this does not mean that a change in the price of coal will not have an impact on the price or consumption of electricity. In fact, China is actively working, as part of their Thirteenth 5-year plan, to add significantly more natural-gas-fired electrical generation.[67] Natural gas constituted just 4% of China's electrical generation in 2013[68] when China's coal imports were at their recent peak. China's Thirteenth 5-year plan has 10% of their electricity coming from natural gas by 2020.[69] As China tries to decouple their electricity and emissions growth from their economic growth, it will have to rely increasingly on natural gas and renewables for electrical generation if they are going to be able to meet their GHG reduction targets.

Japan:

Japan is currently forced to rely much more on coal and natural gas (LNG) then they would like. Following the Fukishima nuclear disaster in 2011, Japan shut down all of its nuclear power plants and since then has only brought two of them back on line in late 2015.[70] Because Japan has not been able to count on the same nuclear power that it once had and because of the political climate surrounding Japan's nuclear facilities, Japan has rethought its reliance on

[63] World Coal Association. Coal Facts 2015. https://www.worldcoal.org/sites/default/files/Coal%20Facts%202015.pdf
[64] Ibid.
[65] The Guardian. China coal consumption drops again. *The Guardian.* 2.29.2016. http://www.theguardian.com/environment/2016/feb/29/china-coal-consumption-drops-again
[66] IEA Statistics. Key Coal Trends Excerpt from: Coal Information 2015. Table II.11. 2015. http://www.iea.org/publications/freepublications/publication/KeyCoalTrends.pdf
[67] EIA. China. International Analysis. 5.14.2015 https://www.eia.gov/beta/international/analysis.cfm?iso=CHN Since this article was written the 13th 5 year plan has set even more ambitious goals for China calling for a 13% rise in natural gas consumption in 2016 and a target of 10% by 2020. http://www.forbes.com/sites/judeclemente/2016/04/24/chinas-rising-natural-gas-demand-pipelines-and-lng/#2830851d6a38
[68] Ibid.
[69] EIA. China. International Analysis. 5.14.2015 https://www.eia.gov/beta/international/analysis.cfm?iso=CHN Since this article was written the 13th 5 year plan has set even more ambitious goals for China calling for a 13% rise in natural gas consumption in 2016 and a target of 10% by 2020. http://www.forbes.com/sites/judeclemente/2016/04/24/chinas-rising-natural-gas-demand-pipelines-and-lng/#2830851d6a38
[70] World Nuclear. Nuclear Power in Japan. Country Profiles. March 2016. http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx

nuclear power. While not getting rid of nuclear power as Japan looks to the future, it has scaled back the amount of nuclear power that it will use going forward.

> *"The government wants to make nuclear energy account for 20 to 22% of Japan's electricity mix, versus 30% before Fukushima, with renewable energy making up 22-24%, liquefied natural gas for 27% and coal 26%."*[71]

Japan (as of 2014) was the world's largest LNG importer, second largest coal importer, and third largest importer of crude oil and oil products.[72] As Japan restarts its nuclear generators their fossil fuel electrical generation will decline, but clearly Japan will not stop burning coal and natural gas any time soon. The key point that we want to make with regard to Japan is that they have very large natural gas fired electrical generating potential. Because of this potential the price of coal relative to natural gas is extremely important because fuel substitution is a very real possibility if the price of either coal or natural gas changes.

South Korea:

As the world's ninth largest energy consumer in 2014, South Korea is one of the top energy importers in the world.[73] Coal makes up 31 percent of South Korea's primary energy consumption, petroleum and other liquids make up 39 percent, natural gas makes up 16 percent, and nuclear makes up 13 percent, with renewables making up about 1 percent.[74] South Korea imported 144 million metric tonnes of coal in 2014 and was the world's fourth largest importer after China, India, and Japan.

South Korea currently runs its coal fired generators at 80 percent of capacity compared to its gas fired generators that run between 35 and 40 percent of capacity.[75] If the delivered price of coal relative to gas were to change, e.g., due to the availability of low cost PRB coal through U.S. export terminals, this could open the potential for fuel substitution that could have dramatic GHG implications very much like Japan. The same is likely true of Japan. Since natural gas has about half of the emissions associated with electrical generation when compared to coal[76] (on an energy basis), the relative price of the two fuels and the climate goals of the different countries are important factors in determining the fuel mix of electrical generation.

Taiwan:

Like Japan and South Korea, Taiwan imports nearly all of its fossil fuels (98 percent).[77] Forty-seven percent of the electricity that is generated in Taiwan is from coal; natural gas makes up 29 percent; and nuclear power makes up 16 percent. Taiwan consumed about 75 million tons of coal in 2013, all of which was imported. Over the period of 1992-2012 the imports of LNG for

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[71] Reuters. Japan outlines 2030 carbon target ahead of Paris climate summit. *The Guardian.* 4.30.2015. http://www.theguardian.com/environment/2015/apr/30/japan-outlines-2030-carbon-target-ahead-of-paris-climate-summit

[72] EIA. Japan: International energy data and analysis. 1.30.2015.

[73] South Korea ranks in the top five energy importers in the world for LNG, coal, crude oil, and refined products. EIA. Korea, South: International energy data and analysis. 10.5.2015.

[74] Ibid.

[75] Ibid.

[76] EIA. FAQ. How much carbon dioxide is produced when different fuels are burned? https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11

[77] EIA. Taiwan: International energy data and analysis. September 2015.

electrical generation grew eight fold.[78] Although Taiwan currently gets 16 percent of its power from nuclear power plants, the Democratic Progressive Party, that was elected in 2016, has a policy in place to phase out nuclear power by 2025.

Taiwan, like Japan and South Korea, gets all of its fossil fuels for electrical generation from imports. Because it has such a large percentage of its electricity that comes from coal and natural gas and because they are planning to phase out nuclear power, there is a strong possibility that their energy mix could be affected by the price of coal relative to natural gas. If either fuel source was to change price dramatically, fuel substitution is a possibility.

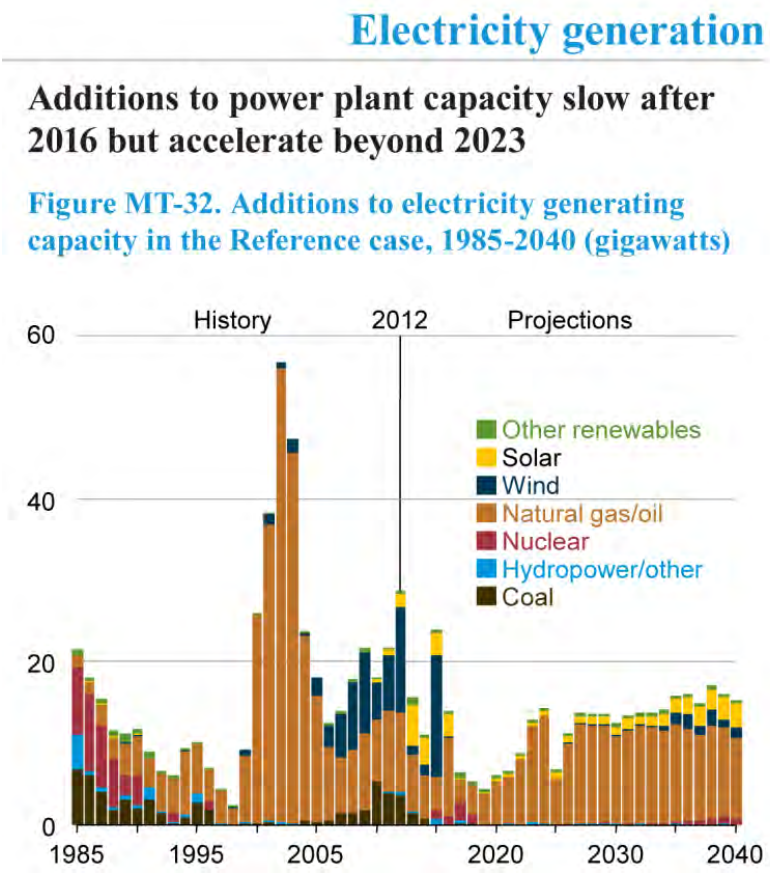
For a more complete set of profiles of the Asian countries mentioned above please see Appendix B.

3. Changes in the domestic US coal market: a decline in coal usage and an increased natural gas consumption

Just as the market for coal in Asia was growing, the market for coal within the U.S. was declining. In fact it has been in decline, if one looks at the amount of money invested in non-coal fired generation, for quite some time. Figure 2 below shows that the U.S. has been heavily investing in natural gas fired generation since the early 2000s and is projected to continue to do so through 2040. It is important to point out that this investment in natural gas fired electrical capacity was happening even as the price of natural gas was significantly higher than coal (on an energy basis). In 2000, the cost of one million Btu of natural gas was as high as $8.90. In fact, it reached a peak in October of 2005 of $13.42 per million Btu.[79] This can be compared against the cost of PRB coal per million Btu which remained below $1 during this entire period.[80] Of course for the PRB coal, it is the cost of transportation that makes up the largest portion of the delivered price. The point that we are making is twofold: 1. That the price of coal relative to natural gas was extremely favorable for coal at the exact time that the U.S. was making massive investments in natural gas fired generation. 2. That the U.S. has been moving away from coal, for a myriad of reasons, since the early 2000s when we began to heavily invest in gas fired generation. Since that time there has been a boom in natural gas production from unconventional wells and natural gas currently produces about the same amount of electricity as coal.[81]

[78] World-Nuclear.org. Nuclear Power in Taiwan. Country Profiles. http://www.world-nuclear.org/information-library/country-profiles/others/nuclear-power-in-taiwan.aspx
[79] EIA. Natural Gas. Henry Hub Natural Gas Spot Price. https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm
[80] EIA. Coal markets archive. https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm and by looking at the EIA Coal Data browser Market average price, Annual for Wyoming: open market and assuming that the coal is 8800 Btu per pound. http://www.eia.gov/beta/coal/data/browser/
[81] EIA. Electricity data browser. Net generation for all sectors, monthly. http://www.eia.gov/electricity/data/browser/

Figure 2.



Source: EIA. Annual Energy Outlook 2014. 2015.

We emphasize the apparent economic anomaly of the investment in the U.S. in gas fired generation in the face of much higher natural gas prices in the early 2000s because of the parallel to the current situation in China where they are actively investing in natural gas fired generation despite the high costs for natural gas relative to coal. There are factors not tied to the relative energy prices of coal and natural gas that are at play in Asia that favor natural gas, just as was the case at the beginning of the 21st century in the U.S.[82] That should caution us away from a simple comparison of the cost of alternative fuels on an energy basis in projecting what the investment pattern will be in differently fueled electric generation.

In addition to the impact that PRB coal exports to Asia may have on international coal markets, such exports could also impact U.S. domestic coal markets by increasing the demand on U.S. coal mines and driving up the domestic cost of mining coal. That, in turn, could discourage the use of coal due to higher coal prices and increase the use of natural gas and renewables in the generation of electricity. In fact, this is the largest source of emissions *reductions* reported in the

[82] Considerations beyond delivered fuel costs include initial capital investment costs and operation and maintenance costs, the different, the cost of controlling emissions and risks that future regulation could increase those costs, the efficiency of the conversion of the energy content into electricity, and the impact of public policy that encourages or discourages the use of different types of fuels.

DEIS. By looking at the total net emissions that are projected in the DEIS,[83] it is clear that the largest offsetting emissions are associated with a rise in the price of coal within the U.S. that advantages natural gas, and possibly renewables, relative to coal. That is, coal exports, while having the potential to increase GHG emissions in Asia may reduce GHG emissions in the U.S. in a somewhat offsetting manner. Whether this domestic impact of PRB exports would be significant depends on how costly it would be for PRB coal mines to increase their annual production to serve both domestic and export coal demands.

In section V.2 below we take a much closer look at the cost curves for the PRB that were used by the DEIS to get a more quantitative view of the cost of increased coal production in the PRB. Here we focus on the past conditions of the PRB.

The PRB is the largest of the domestic coal producing regions in the U.S. Coal production peaked in the PRB in 2008 when almost 496 million short tons of coal were produced. In 2014, the PRB produced 418 million short tons. This is a drop in production of 78 million short tons or about 16% of peak 2008 production.[84] In constant 2014 dollars the price of a short ton of coal in 2008 was $11.68 and in 2014 it was $11.99 (price at mine mouth).[85] The price of coal, then, in the PRB is not rigidly tied to the volume of PRB coal mined. There are many different reasons that this would be the case. The simplest answer is that the cost curve for the PRB is extremely flat in this range of coal production. Historically this has held true as the change in price indicates between 2008 and 2014 as shown above.

We will not get into the various different reasons that the price is not *directly* tied to the volume of production other than to say that in general, with large increases in production, there *is* an expectation that coal mining costs will increase. The key, then, becomes at what volume of increase in coal production is there a significant increase in price, and what is the rate of that price increase. Clearly, as shown by the discrepancy between 2008 and 2014 volumes of coal and the mine mouth prices, the PRB was able to operate at about 500 million short tons of production at about the same coal price as when it was producing just above 400 million short tons per year. Note that we are examining the impact of an increase in production of about 49 million short tons (44 million metric tonnes).

The decrease in demand for PRB coal is tied to a myriad of different factors. The electric generators that had been driven to use PRB coal by the Clean Air Act and its amendments aimed at reducing sulfur and other toxic emissions in the 1990s looked toward future emissions restrictions of coal-fired generation. At the same time that the PRB was dramatically expanding its production of coal to provide a lower cost way of lowering sulfur emissions, the electric industry was looking to expand its fleet of natural gas fired generators (see Figure 2 above). Fast forward to 2007 and the looming Great Recession and the U.S. had reached at least a temporary peak coal consumption.[86] Since 2007, the U.S. has used less coal for energy in

[83] ICF. Millennium Bulk Terminals-Longview SEPA Environmental Impact Statement SEPA Greenhouse Gas Emissions Technical Report. Figure 7. Page 3-3.
[84] EIA. Coal Data Browser. Total US surface mine production by basin. http://www.eia.gov/beta/coal/data/browser
[85] http://www.eia.gov/beta/coal/data/browser/#/topic/33?agg=0
[86] EIA. Power sector coal demand has fallen in nearly every state since 2007. Today in Energy. 4.28.2016. https://www.eia.gov/todayinenergy/detail.cfm?id=26012

almost every year in almost every state. Both natural gas and renewables have been gaining in the share of electrical generation while coal's share has been falling off. To be sure, some of the decrease was associated with a drop in energy consumption as a result of the Great Recession, but just as impactful has been the increase in natural gas and renewable generation as the electric energy industry reacted to the increased regulatory risk associated with older and dirtier coal-fired electric generators as well as the increased likelihood of federal regulation of electric power plant carbon emissions such as EPA's Clean Power Plan.

The end result has been declining coal production in the PRB every year since 2008.[87] This declining production was not the result of a rise in coal prices or the availability of the coal resources in the PRB. Because of looming regulations like the Clean Power Plan, the growing deployment of lower carbon sources of electricity such as renewables and natural gas fired generation, and the influence of the Great Recession on U.S. energy consumption, PRB coal production has been in decline since 2008. As a result the large players in PRB production have been looking for a way to send their coal to different markets like Asia. As was noted earlier, it is not just the PRB players that are facing this new reality. Australian coal companies are years behind schedule and mired in financial difficulty as they look to develop coal basins like the Galilee coal basin.[88]

4. Bankruptcy of some of the largest US coal producers including Arch Coal that recently abandoned its 38 percent interest in the proposed Longview coal port.

As was mentioned above, there has been a rash of bankruptcies among PRB coal producers recently. Arch Coal, Alpha Natural Resources, and now Peabody have all filed for bankruptcy within the last year.[89] Cloud Peak, although not currently in bankruptcy, is paying penalties to the Westshore coal port (Vancouver, BC) because it is not profitable to ship coal to Asia, but Cloud Peak's contract called for fees to be paid whether or not any coal was shipped. This recent spate of bankruptcies from the U.S.'s largest coal producers is tied to the decline in coal demand across the U.S. and around the world. In May 2016, for instance, the Energy Information Administration (EIA) reported that coal production in the U.S. declined by 38 percent when April 2016 is compared with the April 2015. EIA also forecasted that during 2016 U.S. coal production would decline by 17 percent or 150 million short tons. That would be the largest

[87] There was a small increase in production from2009 to 2010 of a little more than 12 million short tons.
[88] Slezak, M. Australian coal mines are one of the riskiest investments in the world-report. *The Guardian*. 1.27.2016. http://www.theguardian.com/environment/2016/jan/28/australian-coalmines-are-one-of-riskiest-investments-in-the-world-report and Molyneaux, L. The case for Australian coal in India is weakening. *The Conversation.* 6.24.2015. http://theconversation.com/the-case-for-australian-coal-in-india-is-weakening-43694 and IEEFA. Galilee Coal Basin: Carmichael- A Stranded Asset? IEEFA. May 2015. http://ieefa.org/wp-content/uploads/2015/05/IEEFA-key-points-Adani-in-Galilee.pdf Much of Peabody's $10.1 billion in debt was incurred for an expansion into Australia. Op. cit. *St. Louis Post-Dispatch*, April 13, 2016.
[89] Paterson, L. As coal mining continues, what does bankruptcy mean on the ground? *Inside Energy*. 3.5.2016 http://insideenergy.org/2016/03/05/as-coal-mining-continues-what-does-bankruptcy-mean-on-the-ground/ and Miller, J. Arch Coal Files for Bankruptcy. *The Wall Street Journal.* 1.11.2016. http://www.wsj.com/articles/arch-coal-files-for-bankruptcy-1452500976 and Joyce, S. Nation's largest coal mining company files for bankruptcy. *PBR Newshour*. The Rundown. 4.13.2016. http://www.pbs.org/newshour/rundown/nations-largest-coal-mining-company-files-for-bankruptcy-protection/

decline in terms of both tons and percentage since data collection started in 1949.[90] The decline in demand affected the PRB where coal production was down 20% when compared to the 2010-2014 average.[91] As U.S. demand for coal has waned, the PRB coal mining companies actively invested in coal port infrastructure to ship their coal to Asia. Peabody invested in the Gateway Pacific Terminal in the Bellingham, WA, area and Arch Coal invested in the Millennium Bulk Terminal adjacent to Longview, WA, as well as the Port of Morrow at Boardman, OR. In late May, 2016, Arch Coal shed its 38 percent interest in the Longview and Port of Morrow coal ports into which it had poured almost $60 million. In return for its partners' agreement to let Arch out of its obligation to make cash advances to support the development of the Longview port, Arch abandoned its past investments in the proposed Longview coal port.[92] Many of the largest coal companies also invested in new supply by buying out other coal mining companies or investing in new or expanded coal mines. As the bottom has fallen out of the international as well as the U.S. domestic coal market, PRB and other coal companies have been forced into bankruptcy. The faith in, and fervor for, the unrealized coal "super cycle" has now been completely abandoned and has been replaced by layoffs, low coal production, and restructuring under bankruptcy protection.

It is not just U.S. domestic coal markets that are depressed. Asian coal markets are also depressed, with lower coal prices and levels of imports. That reduces the assistance that Asian coal demand can provide to Western U.S. coal producers. To understand why the PRB coal is not competitive in Asian markets, it is important to look at the delivered costs of PRB coal to Asian markets and the state of the Asian coal markets now and in the near future.

5. The cost of PRB coal delivered to Asia

In this section we take a brief look at the delivered cost of PRB coal to Asia. Appendix A of this document has a much more detailed accounting of the cost of delivering PRB coal to Asia. One of the basic assumptions in the DEIS is that Western U.S. coal would be competitive in Asian markets. Before analyzing the results of the different scenarios, it is important to understand where the international coal market is right now and how that compares to the assumptions in the DEIS. We will begin with a breakdown of the current ability of PRB coal to price into Japan's coal market. We choose this Asian market because it requires the shortest amount of shipping to get the coal from the PRB to the Asian markets. The DEIS recognized this as it has the majority of the coal exported through the Longview port going to Japan in in most of the scenarios.

PRB coal with a mine mouth cost of $10 per ton, a rail shipping cost of $20.14 per ton, a port fee in the PNW of $8.05 and a dry bulk shipping cost of $2.60 per ton results in a delivered price

[90] Short-Term Energy Outlook, May 10, 2016, https://www.eia.gov/forecasts/steo/report/coal.cfm .
[91] EIA. Coal production and prices decline in 2015. 1.8.2016. http://www.eia.gov/todayinenergy/detail.cfm?id=24472
[92] "Arch Coal Backs Out of Longview Export Terminal," Sightline Institute, Clark Williams-Derry, May 27, 2016. http://www.sightline.org/2016/05/27/arch-coal-backs-out-of-longview-export-terminal/

of $47.59 per metric tonne.[93] Although this delivered price is historically low, it is still not low enough to compete in Asia with Indonesian coal. According to a recent Woods Mackenzie article, which forecasts roughly the same delivered cost, PRB coal's cost is still $12 per ton more than Indonesian coal.[94]

As discussed in detail in Appendix A, we project that PRB coal shipped through the PNW would have more than an $8 per metric tonne *disadvantage* compared to sub-bituminous Indonesian coal. Although this disadvantage is not as high as the Cloud Peak fourth quarter report indicated, we attribute the difference to long term contracts that Cloud Peak signed with shippers which boosted its estimated delivered costs. Our estimated disadvantage is quite close to what was predicted by Woods and Mackenzie in the middle of February 2016 as noted above.

The end result is that the PRB cannot currently price into the Asian import markets. If there were to be some significant positive changes in Asian coal markets, PRB coal could become competitive in the future. The key part to remember when trying to put all of the pieces together is that the mine mouth price of PRB coal is a very small part of the delivered price to the Asian markets. If there was more coal being shipped into Asian markets then, presumably, the ship hiring costs as well as the price of fuel for the ships and the rail transportation cost could increase. The countries that PRB coal will be competing with in the Pacific Basin, chiefly Australia and Indonesia, have slightly shorter shipping distances to the major Pacific Basin coal importers and will continue to price them into the Asian markets ahead of the PRB unless their coal mining costs rise.

We do not have to simply recreate the delivered costs to Asian markets to see that PRB coal delivered to Asia is not currently competitive. The DEIS admits that, currently, the PRB is not competitive shipped into its closest Pacific Basin market:

> *"Delivered prices to Japan in the range of $3.0/MMBtu suggest that Powder River Basin coal would have a difficult time being cost-competitive, if shipped through the Pacific Northwest to Japan or other Pacific Basin countries, until international coal prices increase."*[95]

It should be noted that the DEIS was looking at the competitiveness of PRB coal delivered to Japan in 2014/2015 and not 2016. This clearly supports our delivered prices which are also not competitive as stated above.

[93] Since U.S. coal is sold on a Gross as Received (GAR) basis vs. a Net as Received (NAR) basis we must convert PRB coal to NAR and adjust for the slightly higher Btu content of the Indonesian coal (Btu content of 8814 Btu/lb).
[94] Roberts, A. Planned US coal ports: a swift trip from vital to irrelevant. Blog. 2.10.2016. http://www.woodmac.com/blog/planned-us-coal-ports-a-swift-trip-from-vital-to-irrelevant/
[95] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Page 3-9.

Part IV: The Plausibility of the Alternative Policy and Market Scenarios Used in the Longview DEIS

1. The viability of coal exports from Longview under the different alternative scenarios.

In this section we turn to the economic plausibility of the different scenarios that the DEIS used to evaluate the GHG emissions associated with the proposed Longview port.

In the DEIS, in all of the different scenarios, the same volume of coal goes out of the proposed port: 44 million metric tonnes. This would seem to suggest that the port must be competitive in each of the different scenarios presented by the DEIS. This is not the case, the export of 44 million metric tonnes of coal through the proposed Longview coal port is a model constraint in all of the scenarios. That is, the same amount of coal is shipped through the proposed port and into the Asian market whether or not that coal is competitive. Although we strongly believe that it would have been far more instructive to model a port under the different scenarios and have the model choose when and how much coal should be shipped out of the proposed port, that is not what was modeled. As a result, we are left with a port that may ship uneconomic coal to Asia in multiple different scenarios.

Analyzing the effects of an uneconomic future generates model results that can never happen in the real world, and so they are of little use. What is potentially worse and why we bring up the economics associated with each scenario is that all of these scenarios are presented as if they are a possibility. The implications are that a coal port could be built that ships 44 million metric tonnes of U.S. coal to Asia *and* reduces the GHG of the world. This is a contrived result because, in most of the scenarios that were modeled in the DEIS, the impact on Asian coal consumption and GHG emission are, implicitly, those associated with a Longview coal port that does not operate because it is not commercially viable. We assume that Asia will make rational economic decisions when it comes to the coal that they will use. This means that *if* U.S. coal is shipped out of the proposed port and it is delivered to Asia at a higher cost (in energy terms) than the coal that Asian countries were previously using, the Asian countries would choose not to import that coal. If we view the different scenarios under this lens, we are able to reject as non-feasible or self-contradictory all but one of the scenarios. In other words, the only economic scenario developed in the DEIS that provides useful information is the “Upper Bound.”

a. *Assuming* That Longview Coal Exports to Asia Will Be Competitive

As discussed above, the DEIS recognized that competitive exports of coal through the proposed Longview coal port would reduce the delivered coal costs to coal importing nations in Asia. The addition of a lower cost source of coal supply to those Asian markets would tend to encourage increased consumption of coal energy there.[96] The DEIS recognized the sensitivity of coal energy consumption to delivered coal costs by applying estimates of the price elasticity of

[96] As discussed above, one cannot accurately measure changes in the demand for coal using a measure of weight such as metric tonnes because different coals vary in their energy content per tonne, and it is that energy content that electric generating plants are purchasing. For that reason an energy measure such as Btu should be used in measuring actual changes in coal energy consumption and the carbon emissions associated with the combustion of that coal.

demand for coal energy that the DEIS obtained from the economics literature.[97] Depending on the scenario used, the ratio of the percentage decline in coal energy use to the percentage increase in coal energy cost varied between 0.11 and 1.20.[98]

The model used by the DEIS to study the impact of the Longview coal port on U.S. and Asian coal markets, the IPM, seeks to find the lowest cost mixture of coal sources and coal quantities for the major electric generating plants taking into account the varying costs and energy content of different coal supplies and the transportation costs of moving coal from different mines to different electric generators. That model looks forward and adds additional electric generators as electric demand rises and/or plants are retired. It also expands coal mining to meet increased demand for coal from electric generators, recognizing the fact that as more coal is mined, coal mining costs are likely to rise.

In a similar manner in which the IPM builds and retires electric generators, the DEIS could have linked the demand for coal in Asia to coal mines and coal ports in the U.S. and let the model add west coast coal ports and export coal volumes as market conditions in the U.S. and Asia supported them. That however was not what the DEIS did. Instead it simply assumed that the Longview coal port would be constructed and come on line by 2025 and that under all of its scenarios the full capacity of that proposed port would be consistently used.[99] It did the same thing in its Cumulative Scenario in which it assumed another 56 MMtpy of coal port capacity available to U.S. coal mines would come on line by 2030 in addition to the 44 MMtpy capacity of the Longview coal port. All of that additional coal port capacity was also assumed to be fully utilized each year.[100] The IPM model did not choose those levels of coal purchases by Pacific Basin nations from the U.S. west coast on the basis of market conditions but simply assumed that both the Longview coal port and other proposed ports could always profitably sell their full port capacity each year into Pacific Basin coal markets. In that sense, the IPM was *not* implemented as an integrated international model capable of modeling coal exports.

b. Measuring the Competitiveness of Longview Coal Exports to Asia

The simplest indication of whether or not a scenario is economic is to see how much coal is induced in the scenario. Induced coal represents the response to the price advantage of the U.S. coal shipped out of the proposed Longview port into Asian markets. The U.S. coal has to have a price advantage if it is to be competitive. If there is no induced coal energy consumption, then the coal is either uneconomic or the coal comes in at the exact same price as the Asian suppliers previously relied on and there is perfect substitution of one coal for another with no net increase in energy consumption.

As we have argued in the past, the perfect substitution of one coal for another is an economic anomaly in which supply and demand do not interact to determine the level of consumption. The perfect substitution in the DEIS requires that, over the entire modeling period, the exported U.S. coal prices in at exactly the same price as other Asian coal suppliers. It is the economic

[97] The DEIS applies elasticity of demand to the international market post facto. This means that the induced demand is not incorporated into the market scenarios that they model, it is only used to calculate CO_{2e} for the Asian nations.
[98] Coal Market Assessment Report, p. 4-11.
[99] Ibid. p. 4-4.
[100] Ibid.pp. 6-6 and . 6-7.

equivalent of balancing on the edge of a razor as the delivered cost of the Longview coal is always the same as the market price of coal without the Longview coal. The Longview coal is not a lower cost source of coal nor is it a higher cost source of coal. Yet, in the DEIS modeling, there is a demand in Asia for exactly 44 MMtpy of Longview coal each and every year. As we have successfully argued before the District Court in Colorado, the assumption of this type of "perfect substitution" within coal markets should be rejected.[101]

c. What the DEIS Says about the Competitiveness of Longview Coal in Asia under the Different Scenarios

Remember that in all of the scenarios, whether it is economic or not, the proposed port ships 44 million metric tonnes of coal during all of the model years once the port comes on line. Because it always ships the full port capacity it is unclear whether or not the delivered price of coal (on a Btu basis) from the proposed port would be competitive with other international coal suppliers in each scenario. Here we examine each scenario.

Past Conditions (2014) Scenario

As was discussed in detail above, coal market conditions in both the U.S. and in Asia have changed dramatically since the Longview and other west coast coal ports were first proposed. In general, coal demand has declined and coal prices have dropped. In this setting, it is not clear that coal exported through the Longview coal port or any of the other proposed west coast coal ports would be competitive in Asian markets. The DEIS recognizes this. It points out that shipping coal from the Pacific Northwest to Asia will cost $2.9 per million Btu, but current Asian coal costs are about $2.5 per million Btu. "*Delivered prices to Japan in the range of $3.00 per million Btu suggest that PRB coal would have a difficult time being cost-competitive, if shipped through the PNW to Japan or other Pacific Basin countries* ***until international coal prices increase***" (emphasis added).[102] The DEIS based two of its five scenarios on coal market conditions in 2014 (the Past Conditions and the Cumulative scenarios).

In the Past Conditions scenario one million metric tonnes of coal consumption are induced when 44 million metric tonnes are shipped out of the proposed port. This would suggest that the price of the coal in Asia that the U.S. coal is competing with is very close to the U.S. delivered price. This successful competition for a small piece of market share in Asia stands in contrast to the modeling that we present in Appendix A which indicates that U.S. west coast coal exports would not be competitive and the DEIS's own comments on the current state of the market in Japan where the coal is largely being sent.[103] Because there is not a large change in the price of coal in Asia and almost no induced demand, the Past Conditions scenario comes to the conclusion that there would be a small *decrease* in GHG by shipping 44 million metric tonnes of coal a year to Asia. This is a contrived result that is based on a time frame that should not have been chosen.

[101] Case 1:13-cv-1723-RBJ Filed 6.27.2014. District Court of Colorado: Judge R. Brook Jackson. C Section ii. The Lease Modification FEIS Inadequately Discloses the Effects of GHG Emissions.
[102] Ibid. pp. 3-8 and 3-9.
[103] "*Powder River Basin coal would have a difficult time being cost-competitive, if shipped through the Pacific Northwest to Japan or other Pacific Basin countries*" ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Page 3-9.

The time frame that is chosen for the Past Conditions scenario is suspect since it is a time frame that allows for the coal to price in at, or slightly below, the benchmark prices for Asian coal. As we show in appendix A, if the Past Conditions were based on current prices that coal would not price into Asian markets. If the Past Conditions were based on 2015 that coal also would not price into Asian markets. Choosing a time frame where the coal prices in at exactly the same or at a fractionally lower price as other Asian benchmark prices simply allows the coal to be perfectly substituted for another coal type which we have shown to be an economic fallacy that cannot last.

Lower Bound Scenario

The DEIS based the Lower Bound on economic conditions even worse than the recent past and concludes that under that scenario there would be no induced demand for coal in Asia as a result of Longview exports. In fact, the DEIS states that *"…total non-U.S. thermal coal production would decrease in similar amounts to the increase in U.S. coal production…U.S. thermal coal exports would take the place of some internationally produced coal, instead of adding to overall global coal demand*."[104] Elsewhere the DEIS explicitly states that under the Lower Bound scenario "*does not induce demand in Asia*."[105] The DEIS also is explicit about its doubts as to whether Longview coal could compete in Asia under the Lower Bound Scenario: "*In the Lower Bound Scenario the growth in coal demand in Asia would be only 0.9% and, with the lower international coal prices, would be a challenging market environment for coal transported through the [Longview] terminal*"[106]

In other words, there would be almost perfect substitution of coal exported through Longview in the Proposed Alternative for coal consumption modeled in the No-Action alternative. This perfect substitution occurs even though the delivered price per Btu in Japan (the only country that coal is delivered to in the Lower Bound scenario)[107] increases by 4%-7% in the Proposed Alternative ($0.17 to $0.32 per MMBtu, depending on the model year):[108] "…*in the Lower Bound Scenario there is no change in the heating value of the coal consumed in the Pacific Basin; however, there is an increase of 12.1 million metric tons due to switching to consuming more coal that has a lower heat content*."[109] This shows conclusively that the coal is forced in the modeling of the ports. If it was not forced both Japan and Asia as a whole would not choose to accept the higher cost coal from the proposed port.

Because this scenario is uneconomic and contrived, this scenario has to be rejected as inconsistent with a commercially viable Longview coal port.

[104] Ibid. p. 6-25, Figure 28.
[105] ICF Greenhouse Gas Technical Report, p. 3-8.
[106] Op. cit. Coal Market Assessment Technical Report, p. 6-26.
[107] Ibid. p. 6-29, Table 49.
[108] From the difference in weighted average delivered coal prices derived from IPM model results for the DEIS provided by IPM. This increases the modeled annual cost of coal in Japan by an average $734 Million over the 15 years between 2025 and 2040 in the No-Action vs. Proposed Alternatives; all of the other affected Asian nations see a reduction in the cost of coal with China realizing a ~$390 Million annual decrease in cost. In total, the affected Asian nations incur a ~$54 Million annual increase in cost for coal in the Proposed Alternative Lower Bound scenario than in the associated No-Action scenario.
[109] Ibid. p. 6-7. Figure 21, p. 6-6, right panel shows zero impact of Longview coal exports on the consumption of coal energy measured in Btu.

2015 Energy Policy Scenario. The "Preferred Scenario"

Another DEIS scenario, which is labeled the "preferred" scenario, is the 2015 Energy Policy, which includes the implementation of the U.S. EPA's Clean Energy Plan and the bilateral agreement between the U.S. and China to mutually curtail carbon emissions. In that scenario, it is not clear if the proposed Longview coal port would be competitive in the sense of providing a coal supply to Asia at a delivered cost below what would exist there under the no action alternative. As the DEIS states:

> *"In the Pacific Basin [under the 2015 Energy Policy Scenario], coal consumption would be higher on average by 0.6 million metric tons per year between 2025 and 2040. The changes in consumption would be primarily due to changes in the mix of coal consumed and the differences in heat content of the coal being consumed, as the amount of induced demand is only about 0.45 million metric tons."* (p. 6-51)

The DEIS is explicit that Longview coal is unlikely to be competitive under the 2015 Energy Policy scenario: "*Under the 2015 Energy Policy Scenario the growth in coal demand in countries in Asia would be only 0.8%, which would be a challenging market environment for coal transported through the [Longview] terminal*.[110]

This scenario was presented as the "preferred scenario". However, presenting this scenario as the preferred scenario is misleading since the IPM forces PRB coal onto the international market through the proposed Longview coal port without showing that the port would be economically operable.

Given that the total projected coal consumption for the Pacific Basin in the No-Action Alternative for the 2015 Energy Policy scenario averaged 5,398 million metric tons[111] to Asian nations, the 0.45 MMtpy estimated induced demand is essentially zero (0.008 percent). That is, the Longview coal exported to Asia would not deliver significantly lower cost coal to Asian nations.

Cumulative Scenario

We recognize that it is a requirement to present a cumulative scenario to satisfy SEPA guidelines. The Cumulative scenario may serve the purpose of showing how the proposed Longview coal port, in addition to other coal port proposals that are not directly related to the proposed action on the Longview coal port, would impact the environment. That, however, is an entirely different function than the other scenarios developed in the DEIS. The other four scenarios seek to answer a question specifically about the expected environmental impacts associated with the Longview coal port. They seek to isolate those impacts caused by the Longview coal port. That is not, however, what the Cumulative scenario does. It seeks to measure the cumulative impacts of the Longview coal port *and* the impacts of the other proposed coal ports. But authorizing the Longview coal ports (the proposed action) has no direct impact on the authorization of the other proposed ports. The impacts estimated under the

[110] Ibid. p. 6-50.
[111] Ibid. Table 77, p. 6-51.

Cumulative scenario are not primarily the impacts caused by the Longview coal port. In that sense it does not measure the impacts of the proposed action. That does not mean that it cannot contribute information on a separate issue: How might all of these ports together impact the environment? That, however, is typically dealt with in a separate section of an Environmental Impact Statement where it is not only the impact of the proposed action that is at issue. Since the Cumulative scenario is answering a different question that that posed by the other four scenarios, it would be best not to consider it side-by-side with the other scenarios.

If the Cumulative scenario is used in the cumulative impacts section of the EIS, it would be a good idea to provide an update on the status of those other proposed coal ports so that the reader has a better feeling for what the potential of each of these proposals is at the current time. Since then the expansion of the Ridley[112] and Westshore[113] ports in British Columbia have been abandoned because of weak market condition. The Neptune expansion was approved in 2013 but the expansion has not been undertaken.[114] The Gateway Pacific coal port outside of Bellingham, WA, has been denied a permit by the U.S. Army Corps of Engineers[115] and the Oregon Department of State Lands has rejected the Coyote Island port.[116] The Fraser Surrey Dock proposal to add 4 MMtpy of coal shipping capacity has been permitted but faces other legal challenges. Thus five of the 6 proposed coal port developments (other than the Longview proposal) are at least temporarily suspended. The other that is still active (Fraser Surrey) is quite small.

The Cumulative scenario, despite being based on the Past Conditions (2014), appears to indicate that the construction and operation of the Longview coal port as well as other proposed new or expanded coal ports on the west coast of North America would lead to large volumes of competitively priced coal to be exported to Asia at delivered costs below existing coal costs in Asia. As a result, there would be substantial increases in coal consumption and carbon emissions in Asia. It is important to note that the projected export of low cost coal to Asia under this scenario is *not associated* with the coal shipped through the Longview port since the Cumulative scenario makes the same coal market assumptions as the Past Conditions (2014) scenario in which the full capacity of the proposed Longview coal port was exported with almost no induced demand in Asia. Instead, the lower delivered cost of coal to Asia must be associated with coal shipped through other west coast coal ports that the Cumulative scenario assumed would come on line in 2030.

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[112] Ridley delays expansion of terminal in B.C. The Global Mail. 11.24.2014. http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/ridley-halts-expansion-of-terminal-in-bc/article21719629/

[113] Westshore Terminals cuts forecast as B.C. feels effects of coal slump. The Global Mail. 1.3.2016. http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/ridley-halts-expansion-of-terminal-in-bc/article21719629/

[114] http://www.portvancouver.com/wp-content/uploads/2015/03/january-2013_final_neptune-project-input-consideration-memo.pdf

[115] Army Corps rejects permit for coal terminal at Cherry Point. Bellingham Herald. 5.9.2016. http://www.bellinghamherald.com/news/local/article76545117.html

[116] Curtis, K. Coal Export Terminal Rejected Amid Collapsing Global Market. *GOLOCAL PDX.* http://www.golocalpdx.com/news/coal-export-terminal-rejected-amid-collapsing-global-market

This conclusion is also based on the fact that under the Cumulative scenario, in 2025 when the Longview coal port comes on line and before the other west coast coal ports come on line in 2030, the DEIS shows almost no increase in the consumption of coal energy in the Pacific Basin nations. Although about 7 MMtpy of additional coal consumption takes place in Asia, only about the equivalent of 1 MMtpy of that represents increased coal energy consumption measured in Btu. This is very close to perfect substitution of Longview coal for coal currently being used in Asia at almost the identical existing cost of coal energy in Asia.[117]

In 2030, under the Cumulative scenario Proposed Action alternative, the DEIS has the other proposed west coast ports come on line and operate at full capacity. This, the DEIS says, leads to a large flow of lower cost coal to Asian markets and a large increase in the induced consumption of coal energy there:

> *"[U]nder the Proposed Action there would be a 0.44 % increase in demand [in Pacific Rim nations] in 2025 and a 3.8% increase in demand in 2030 that would be induced due to lower delivered coal prices from the [Longview] terminal and the other proposed terminals that are modeled to come on line in 2030*."[118]

The DEIS sees almost a nine-fold increase in induced demand as a result of the west coast coal exports increasing from 44 to 100 MMtpy because other west coast coal ports in addition to Longview come on line.

This makes clear that this Cumulative scenario is not focused primarily on the impacts associated with the Longview port and therefore should not be treated the same way as the other four scenarios that *are* focused exclusively on the impacts caused by the proposed action: The authorization of the Longview coal port. These other proposed coal ports are not in any way dependent on the construction and operation of the Longview coal port. They will come online or not depending on market conditions and regulatory approval separate and apart from whatever decision is made about permitting the Longview coal port. For that reason, if this scenario is to be compared with the other scenarios, the additional 56 MMtpy of coal port capacity that is assumed to come on line in 2030 should have been included in both the No Action and Proposed Action. In that correct modeling setting for comparable scenarios, those other proposed ports would not directly affect the differential impact of the Proposed Action alternative compared to the No Action alternative. As a result the implied impact of the Longview coal port in the Cumulative scenario would be much smaller.

The DEIS discussion of the impact of the Proposed Action under the Cumulative scenario repeatedly says that under that scenario: "*The increase in Pacific Basin demand is due to the induced demand from the lower-priced coal being exported through the [Longview] terminal*" or that there will be significant induced demand for additional coal energy because of the

[117] Ibid. See Figure 21, p. 6-6. The left panel shows the increased consumption in MMtpy while the right panel shows the increase in coal energy consumption in Btu. The 25 trillion Btu increase in coal energy consumption under the Cumulative scenario represents 1.3 MMtpy of 8800 Btu/pond coal. The projected No Action Alternative Pacific Basin Coal consumption in 2025 was 6,273 MMtpy. Thus the induced coal energy consumption was about two-hundredths of one percent of total coal consumption. That is pretty close to perfect substitution of Longview coal for coal currently being used in Asia at almost exactly the same delivered cost of coal energy.
[118] Ibid. p. 6-62.

"*reduction in delivered coal prices under the Proposed Action*."[119] The DEIS, however, never explains where the lower delivered coal prices would come from given that the Cumulative scenario is tied to the market conditions associated with the Past Conditions (2014) scenario in which the coal shipped from the proposed port would only induce 1 million metric tonnes of coal in Asia.

Because this scenario, like the Past Conditions (2014) scenario, is tied to a contrived time period where U.S. coal prices into the Asian market at or slightly below the other possible sources of coal, a situation that cannot last, and because this scenario is based on a series of ports that are not part of the proposed action, this scenario should not be compared to the other four. It serves a different function and answers a different question.

We recognize that the DEIS must present this sort of cumulative scenario to satisfy SEPA guidelines, but it should not be compared to the other scenarios and evaluated the same way in the DEIS. Instead this Cumulative scenario should be presented as a stand-alone scenario for the cumulative impacts section. Finally, the Cumulative scenario should have been based on the only economic scenario, the Upper Bound, so that the impact of the ports could be viewed in the market conditions that they were proposed in and in which they would be competitive.

Conclusion

In four of the five scenarios used in the DEIS coal market analysis, Longview coal exports to Asia are not obviously competitive. The DEIS "forces" those exports into the market, either causing Asian markets to carry the extra cost or causing changes in coal mining volumes before the proposed coal port is operational. This could assure perfect substitution of Longview coal for some other International coal. With no definitive delivered cost difference, there is also no definitive increase nor decreased coal energy consumption as a result of the Longview exports. Without a definitive change in consumption, the results are unlikely and uneconomic and require perfect or near perfect substitution of one coal type for another. Because the Longview coal is forced into the Asian market by the IPM, it cannot be rejected as uncompetitive, but it also does not trigger any significant change in coal energy consumption or carbon emissions. The artificial and unreasonable constraint that was imposed in the modeling efforts of the DEIS of forcing the full capacity of the proposed Longview coal port into the international market requires that the coal is always shipped to Asia even if that coal is not economic, this results in the price of PRB and other U.S. coal rising and making that coal less competitive domestically. The fact that the Upper Bound scenario is the only obviously economic scenario modeled in the DEIS calls into question whether the proposed Longview coal port would ever be commercially viable.

The DEIS should have allowed the model to choose when the proposed port came on line and how much coal the proposed port shipped under the different scenarios. If a scenario is presented, such as the Lower Bound, where no coal is shipped, then it cannot be considered the "lower bound" because it has no impact. Because we are left with only one economic scenario, the Upper Bound, it should be considered as the only plausible scenario.

[119]Op. cit. Coal Market Assessment Technical Report. See, for instance, pp. 6-62, 6-63 and 6-70.

Part V: The DEIS's Estimates of the Impact of the Longview Port Coal Exports on Domestic U.S. Energy Markets

1. Introduction

The DEIS assumes that for four of the five modeled scenarios the proposed Longview coal port would create a new demand for western U.S. coal, primarily PRB coal, equal to the design capacity of that port, 44 MMtpy. For the other scenario (Cumulative) that increased demand would be 100 MMtpy because of the other proposed west coast coal ports. This increased demand would lead to increased production at PRB mines, leading to increased mining costs. According to the DEIS analysis, those higher PRB mining costs would cause coal costs to electric generators to rise and disadvantage coal as a fuel for electric generation in the U.S. in favor of natural gas or renewable energy sources. As a result, coal consumption in the U.S. would decline and lower or zero carbon energy sources would replace the coal, reducing overall carbon pollution in the U.S. That is, the DEIS concludes that exporting coal through the Longview and other west coast coal ports would reduce carbon pollution associated with electric generation in the U.S. In this section we critically explore that factual basis for that conclusion.

Before looking at the how PRB coal mining costs would rise as coal production is increased there, it is important to recognize that mine mouth coal production costs are just part of the delivered cost of coal to electric generators. Especially for the relatively remote but very cheap PRB coal, the costs of transporting the coal to the electric generators can represent a significant part of the total delivered cost of the coal to electric generators.

For the years 2009 to 2014, on average, the PRB mine mouth price of coal was 36 percent of the delivered price of coal to electric generators.[120] That means that a 10 percent increase in PRB coal mining costs would raise the delivered cost of the coal only 3.6 percent. The DEIS's projection of a 16.6 percent increase in PRB coal mining costs would result in a 6 percent increase in the cost of coal to electric generators burning PRB coal. Thus, for the very low production cost PRB coal, changes in mining costs get diluted by the relatively high transportation costs to move the coal to eastern and southern population centers and, therefore, have a smaller impact on coal consumption.

In the Coal Market Assessment Technical Report prepared in support of the Longview DEIS, the DEIS projected that coal exports from Longview would tend to decrease coal consumption in electric generation in the United States under all of the five scenarios the DEIS analyzed. As that Technical Report put it:

> *"This analysis shows that coal consumption in the United States would decrease in all five scenarios under the Proposed Action as the export of coal through the [Longview coal] terminal would cause additional demands for U.S. coal, which*

[120]Both costs expressed in constant 2014 dollars. U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report." Table 2, "Real average annual coal transportation costs by primary transport mode and supply regions." Mine mouth spot prices used for the mine mouth costs. They come from the EIA Coal Markets reports on average weekly coal commodity spot prices. http://www.eia.gov/coal/markets/

> *causes coal prices to rise. In response to the higher coal prices, U.S. coal [-fired electric generating] plants consume between 0.3 to 16.3 million metric tons per year less coal. If flatter coal supply curves were used in this analysis, then the decrease in U.S. coal consumption would be less. Similarly, if steeper coal supply curves were used in this analysis, then the decrease in U.S. coal consumption would be greater."* (p. 7-2)

These projected decreases in U.S. coal consumption would tend to reduce CO_2 emissions in the U.S. The DEIS correctly takes into account the substitution of natural gas for some of the reduced use of coal for fueling electric generation. Because natural gas is a less carbon intensive fuel than coal, there would be a reduction in CO_2 emissions even if there was complete substitution of one fossil fuel (natural gas) for another (coal) that had gotten more expensive. Economists term this substitution of one fuel for another that has gotten more expensive the *cross-elasticity of demand* for natural gas with respect to the price of coal. It is part of the adjustment made within markets when a price changes relative to market-related other prices.

In the DEIS's coal market modeling not all of the reduction in the use of coal leads to the substitution of natural gas in electricity generation. It appears that a substantial part of the reduced coal-fired electric generation is offset by increases in renewable electric generation.[121] The DEIS does not indicate exactly what all of the market adjustments are in response to the assumed increase in the cost of coal due to the mining of an additional 44 MMtpy of coal to serve the Longview coal port.

In 2014 PRB coal production was 379 MMtpy, 71 MMtpy below its peak 2008 production level of about 450 MMtpy. The DEIS projects that with the full capacity of the Longview port being utilized, the PRB coal mining levels under the Commercially Feasible Longview Port (upper bound) scenario would be 435 MMtpy, below previous levels of PRB coal production. In that sense the operation of Longview coal port at full capacity is not projected by the DEIS to push PRB coal mining above its previous levels of operation. Instead, the Longview port would help the PRB to put its existing capacity back into production. We do not believe that this recovery to past levels of operation would significantly increase PRB coal mining costs.

As the quote immediately above from the DEIS Coal Market Assessment makes clear, whether the mining of an additional 44 MMtpy of coal to serve the proposed Longview port would cause a significant increase in the cost of mining PRB coal that then would discourage consumption of coal in the U.S. depends on how flat or steep the PRB coal supply curve is. In fact, that PRB supply curve is quite flat in the production range that the DEIS models and for that reason one would expect a significant increase in the cost of PRB coal because of the increased mining to supply the proposed Longview port. As we pointed out in section III.3 above, the PRB has already increased and now subsequently decreased its output by more than the proposed action (44MMtpy) without a corresponding price change.

[121] For all of the scenarios ICF comments that "*U.S. coal consumption [or production] would be fairly flat between 2020 and 2040 as electric demand growth is primarily met with natural gas and renewable generation*." See Chapter 6, pp. 10, 13, 14, 26, 38, 49, 55, 61, and 62.

2. U.S. Geological Service Analysis of Economic Coal Supply in the PRB

The U.S. Geological Survey (USGS) has recently reviewed the coal reserves in the Wyoming and Montana PRB.[122] Part of that effort included estimating how rising mine mouth PRB coal prices would increase the size of the coal reserves that were economic to develop and mine. That is, the USGS analyzed the relationship between coal depletion through mining and the cost per ton of mined coal.

The "reserve estimate" for the USGS, which is based on the amount of coal that could profitably be mined for any given mine mouth coal price has a near constant slope from 10 billion tons up to above 50 billion tons.[123] The slope of that line indicates that the increase in the price to make more coal economic is the same over this very large volume of coal. It describes a fairly simple relationship where, for every $1 increase in the value of coal, another 2.38 billion tons of coal reserves becomes economically available. See Figure 3 below.

Keep in mind that at its peak, coal mining in the PRB was producing about a half-billion tons per year. The 10 billion and 18.5 billion tons of coal show in Figure 3 below represents a 20 year supply of coal at a price of about $10.50. At the $14.00 price also shown, there would be a 37 year supply.

This USGS cost curve (Figure 3) would suggest that a 50 million ton increase in annual PRB coal production would increase the cost of production by about 2 cents per ton. Of course this only takes into account the incremental increase of mining 50 million tons of coal for one year. If we assume that additional 50 million tons would come out of the PRB for the next 25 years (the time period used in the DEIS), the increase in price to accommodate for that 1.25 billion tons of additional coal mined would be $.53 per ton. This does not account for other mining in the PRB, however, since the slope of the line is constant for so long the incremental price increase associated for any given incremental change in mining would be the same for any plausible level of mining.

[122] USGS. "Assessment of Coal Geology, Resources, and Reserve Base in the Powder River Basin, Wyoming and Montana." Fact Sheet 2012-3143. February 2013. http://pubs.usgs.gov/fs/2012/3143/fs-2012-3143.pdf

[123] USGS. Assessment of Coal Geology, Resources, and Reserve Base in the Powder River Basin, Wyoming and Montana. Figure 4. February 2013. http://pubs.usgs.gov/fs/2012/3143/fs-2012-3143.pdf

Figure 3.

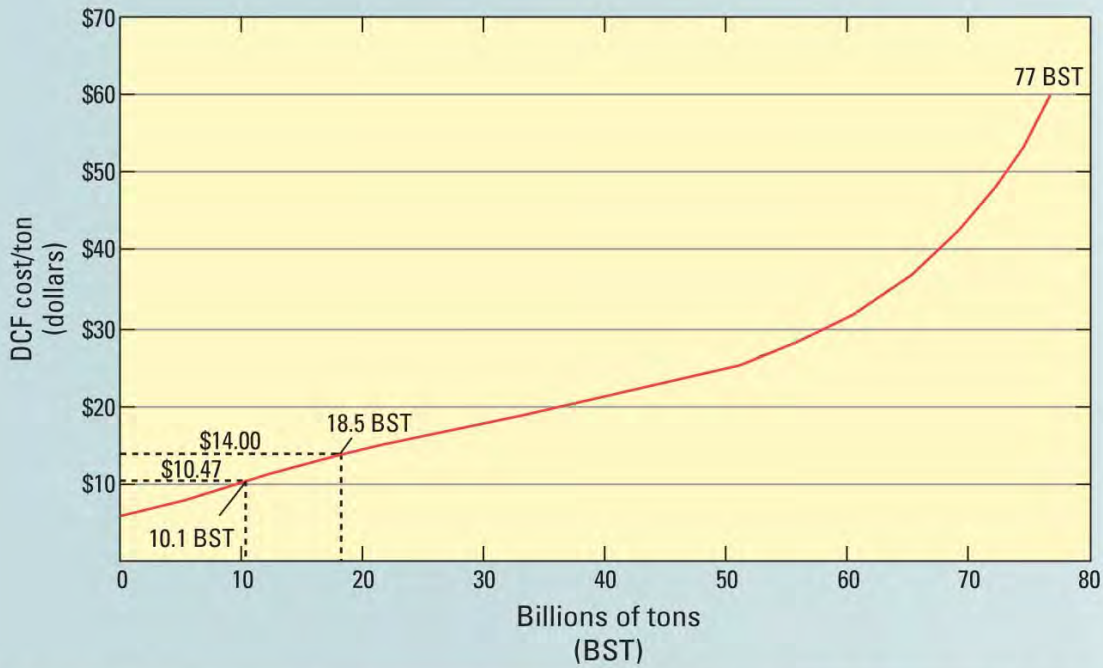


Figure 4. *Cost curve showing reserve estimates at $10.47/ton (as of January 2007) and $14.00/ton (as of March 2008) for the Gillette coal field, Powder River Basin, Wyoming (Luppens and others, 2008). [Abbreviation: DCF, discounted cash flow]*

Source: USGS. Assessment of Coal Geology, Resources, and Reserve Base in the Powder River Basin, Wyoming and Montana. Figure 4. February 2013.

3. PRB Coal Supply Curves

The DEIS states that it used the coal supply curves provided by EPA in its documentation[124] for the 2013 version of IPM to determine how increased levels of PRB coal mining would affect the cost per ton of producing that coal.[125] Those coal supply curves for the PRB were extracted from the EPA documentation, covering both the Montana PRB segment as well as the two Wyoming PRB segments.[126] These three PRB supply curves were combined to create a single "merit order" supply curve for the region for each study year used in the DEIS.[127]

[124] "Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model," EPA # 450R13002, November 2013.
[125] Coal Market Technical Report, Longview DEIS p. 4-5.
[126] The Montana part is labeled "Montana, Powder River." The Wyoming parts are labeled Wyoming Northern PRB and Wyoming Southern PRB. The abbreviations are MP, WH, and WL, respectively.
[127] These three PRB supply curves were combined by sorting by year and then by cost of production. The cumulative coal production associated with each price was developed. The plot of the coal cost against the cumulative level of production provided the PRB coal supply curve for each year.

Figure 4 below shows that set of supply curves stated in metric tonnes for each of the DEIS coal market modeling study years. They show how mining costs rise as more and more expensive supply sources are turned to.

In order to locate where on these supply curves PRB coal production is projected to be in the DEIS's modeling, we can look at the PRB coal production that the DEIS estimates for each study year for each of the five scenarios if the Longview coal port is built and operates at full capacity exporting coal.

This is shown in Table 3. The upper panel of Table 3 shows the DEIS projected levels of coal mining in the PRB if the Longview coal port is built (the "Proposed Action"). The second panel shows the change in PRB coal mining caused by the Longview port facilitating the increased export of PRB coal.

Figure 4.

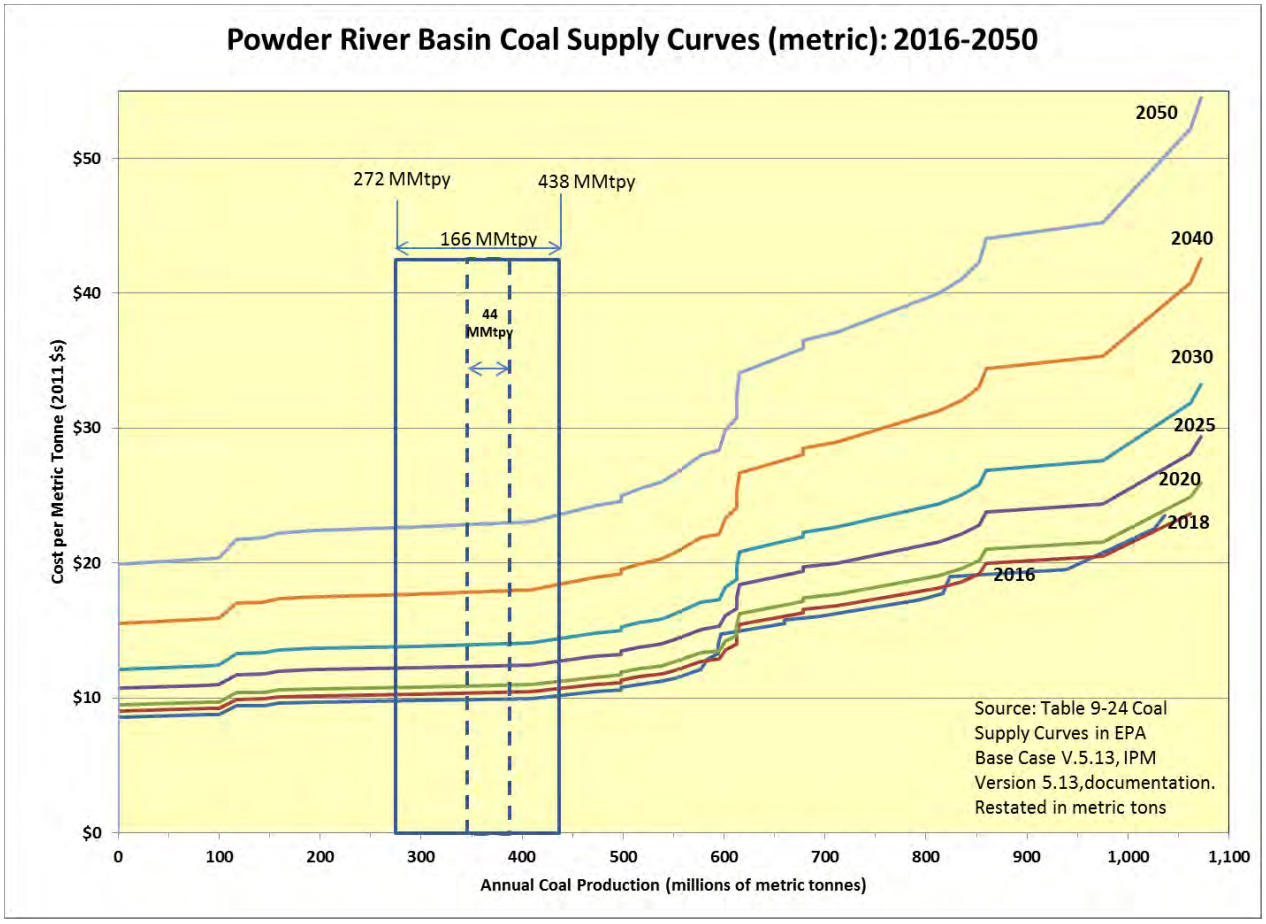


Table 3.

PRB Coal Production under Proposed Action by Scenario (MMtpy)				
Scenario	**2025**	**2030**	**2040**	**Avg 2025-40**
Past Conditions (2014)	363	361	353	359
Lower Bound	302	295	290	295
Upper Bound	427	438	438	435
2015 Energy Policy	272	267	266	268
Cumulative	361	407	396	390
Increase in PRB Coal Production Due to the Propose Action by Scenario (MMtpy)				
Past Conditions (2014)	27.2	29.8	9.6	21.2
Lower Bound	41.7	41.8	30.6	37.4
Upper Bound	17.2	29.6	39.9	30.2
2015 Energy Policy	30.5	42.1	23.6	31.7
Cumulative	25.0	75.8	52.0	52.4
Source: Coal Market Technical Report, Longview DEIS, various tables.				

As the upper panel of Table 3 shows, if the Longview port is built, PRB coal production is projected by the DEIS to vary from 272 to 438 MMtpy depending on the scenario and the year. That is a range of 166 MMtpy. The increase in PRB coal production caused by the building of the Longview port will vary from 9.6 to 75.8 MMtpy depending on the year and the scenario as shown in the lower panel of Table 3.

The DEIS's range of projected PRB coal production with the Longview coal port built is shown in the rectangle with the solid outline on Figure 4. The 44 MMtpy Longview coal port capacity is shown in the rectangle with the dashed outline.

Note how flat the supply curve is in this range of production. The percentage change in the mining cost per ton caused by a 44 MMtpy increase in production to serve the Longview coal port would be only 1.6 percent. Since PRB coal mining costs are projected to increase over time, this would represent a 17 to 38 cents per ton increase in mining costs depending on the study year.

As the DEIS pointed out in the quotation above, increases in PRB coal mining costs is important in the DEIS modeling because the increases in the cost of mining PRB coal is assumed to discourage use of coal and the substitution of natural gas or renewable generation for coal, a much less carbon intensive sources. For instance, in the Cumulative scenario, in which all of the other proposed new or expanded west coast coal ports come on line and are fully utilized by 2030[128], the DEIS projects that PRB coal mining cost per ton would be 16.6 percent higher and, as a result of those higher coal costs, U.S. coal consumption would decrease by an average of

[128] The Cumulative Scenario Proposed Action appears to include not only the Longview port which is the subject of this DEIS but also the addition of other west coast port capacity as of 2030. As a result, for instance, the Proposed Action leads to an increase in PRB coal production of almost 76 MMtpy in 2030. It is not clear that these other ports should be part of the Proposed Action being analyzed by ICF. As independent proposals, they should be part of the No Action alternative and present in both the No Action and Proposed Action alternatives.

16.3 MMtpy if the Longview port were build and operated.[129] Because of these decreases in U.S. coal consumption, because of the increase in PRB coal costs and, therefore, the increase in overall U.S. coal costs, U.S. CO_2 emissions from coal-fired electric generation are projected to decline.[130]

For the PRB coal cost to rise 16.6 percent as a result of increasing coal production beyond the No Action level of 331 MMtpy under the Cumulative scenario, it would take far more than an increase of 76 MMtpy triggered by the Proposed Action. PRB coal mining would have to increase to 556 MMtpy, an increase of 225 MMtpy or 68 percent over the No Action level to have that impact on PRB coal mining costs. Yet the DEIS does not project PRB coal mining to ever surpass 438 MMtpy under any of its scenarios or years. See Table 3 above. That is, the projected PRB coal mining in the DEIS's modeling would have to be 118 MMtpy higher than the production level it projects for PRB coal costs to rise as high as 16.6 percent.

Put differently, the DEIS's modeling projects PRB coal supply costs to rise much more rapidly than the EPA coal supply curves support. As a result, the DEIS projects larger substitutions of lower carbon sources of electricity than coal-fired generation and lower overall CO_2 emissions than is appropriate given the flatness of the PRB coal supply curves.

The DEIS seems to be aware of the fact that the PRB coal supply curves are very flat in the range of PRB coal mining that is relevant to the analysis of the proposed Longview coal port. For three of the five scenarios that it analyzes it describes that change in PRB coal prices due to the increased mining to serve the Longview port as "slightly higher."[131]

To put these changes in PRB coal production in context, the 2015 level of PRB production was 362 MMtpy,[132] almost 200 MMtpy below the level necessary to cause a 16.6 percent increase in PRB mining costs in the Cumulative scenario. The maximum PRB coal production level was 450 MMtpy in 2008[133], 106 MMtpy below the level of production for the 16.6 percent cost increase. The maximum PRB coal production level that the DEIS projects is 438 MMtpy in the Upper Bound scenario, which is still lower than the 2008 peak level of PRB coal production.

The maximum level of PRB exports through the Longview port, however, is in the Cumulative scenario. In that scenario another 56 MMtpy of PRB coal is assumed to be exported through the other proposed coal ports on top of the 44 MMtpy exported through the Longview port, bringing the total exports in 2030 to 100 MMtpy.[134] It is that scenario that the DEIS says led to their projected 16.6 percent increase in PRB coal mining costs.[135] In that Cumulative scenario, the maximum level of PRB coal production was calculated by the DEIS to be just above and below

[129] Pp. 6-62 and 6-63.
[130] If the substitute for coal is renewable electric generation, the decline in carbon emissions is the full carbon content of the coal. If natural gas is substituted for the coal, the carbon associated with the combustion of the natural gas has to be treated as a partial offset to the decline in coal combustion emissions.
[131] P. 6-22 for the Past Condition; p. 6-34 for Lower Bound, and p. 6-46 for the Upper Bound.
[132] U.S. EIA Coal Production by State, Table 2, t2p01p1.xls, annual totals preliminary.
[133] U.S. EIA Coal Data Browser, active, subbituminous, surface coal mines in the Powder River Basin.
[134] ICF Coal Market Assessment Technical Report, p. 6-6. The coal exports reported there are asserted to be all PRB coal,
[135] Ibid.

400 MMtpy in 2030 and 2040, averaging 390 MMtpy between 2025 and 2040.[136] That level of PRB production would be 150 MMtpy ***below*** the level of production that would trigger a 16.6 percent increase in PRB mining costs the DEIS projects. This comparison is shown on Figure 5 below which shows the same EPA PRB coal supply curves shown in Figure 4.

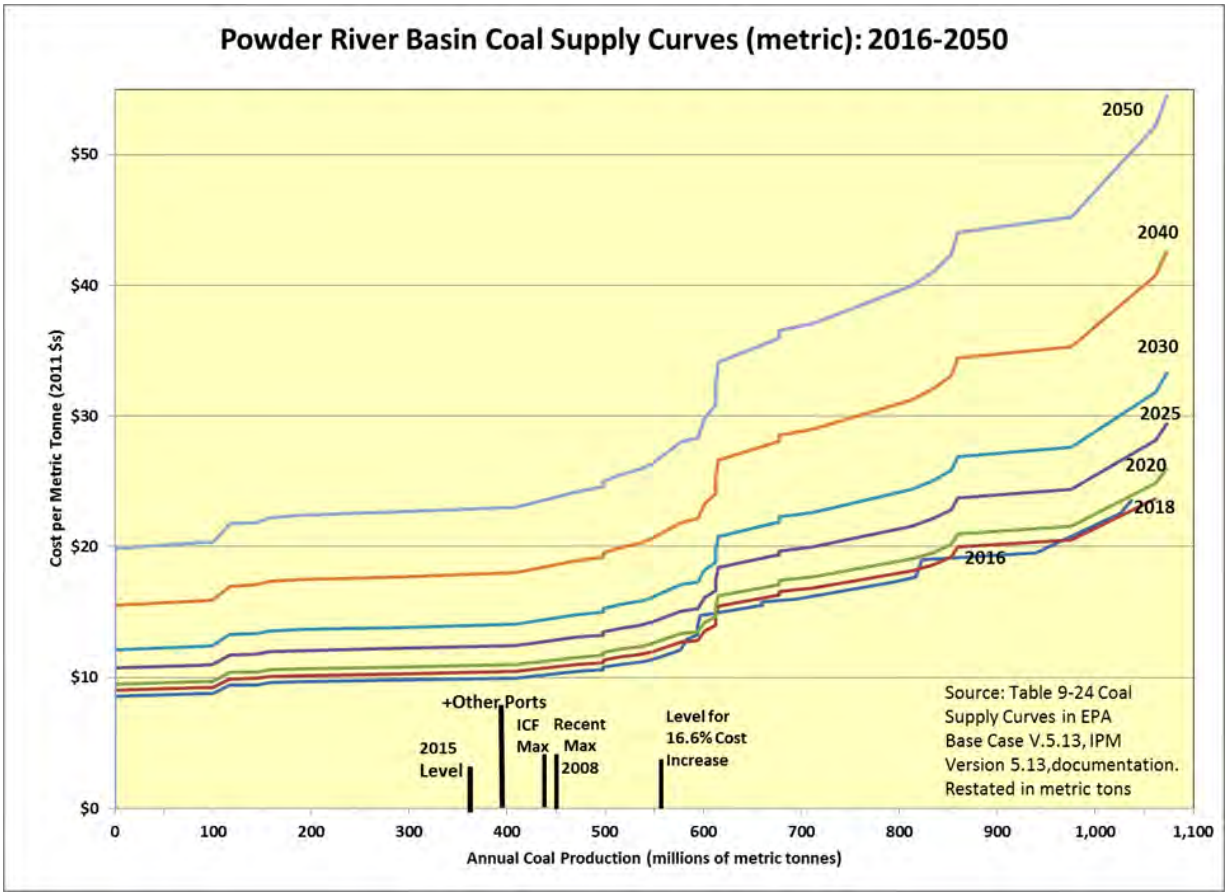
The second panel in Table 3 above shows how the construction and operation of the Longview coal port would change PRB coal production by scenario and year. Averaged over the 2025 to 2040 period, the increase in PRB coal production would be about 52 MMtpy, not the 100 MMtpy suggest by the DEIS.[137]

Coal production in 2015 in the Powder River Basin was 88 MMtpy below the peak production of 2008 of about 450 MMtpy. That is the equivalent of twice the demand the proposed Longview port might place on regional coal mines. Operating a mine well below its design capacity can lead to higher costs per unit of coal produced because some of the operation and maintenance costs do not decline proportionately as production declines. For that reasons increased production back towards the design capacity of the mine might actually *decrease* mining costs until production moves beyond the design capacity. Currently there is clearly unused mining capacity that could serve the proposed port without causing significant increases in mining costs. In that setting, there would be little or no increase in PRB coal mining costs and overall U.S. coal costs that would drive down the use of coal.

One important point to remember, when dealing with the Montana portion of the PRB, is that historically it has had a fairly limited geographic domestic market for its coal. This is due to the fact that Montana is at a transportation cost disadvantage relative to Wyoming in reaching most of the national coal market. This relative isolation of Montana coal from domestic U.S. markets means that Montana coal has been much less extensively developed. As a result, over the last two decades Wyoming has been producing ten times as much coal as Montana and, as mentioned above, during the last 35 years, cumulative coal production in Wyoming has been over seven times larger than in Montana. As a result, there are coal deposits still available in Montana where the coal is relatively close to the surface and the amount of overburden that needs to be removed is still quite low. As documented in the DEIS developed for the Tongue River Railroad that was intended to facilitate several new coal mines in the Tongue River Valley of Montana, there were substantial coal reserves available at a mine mouth cost of $10 per ton.[138]

[136] Ibid. Table 90, p. 6-60.
[137] Ibid p. 6-6.
[138] U.S. coal production is assumed to decline by .95 tons per ton of TRR coal mined without a change in the price of U.S. coal. Surface Transportation Board. Tongue River Railroad Environmental Impact Statement. Appendix C. Coal Production and Markets. C.8-5.

Figure 5.



Although the PRB as a whole would likely see a small cost increase associated with the increased production of 44 million metric tonnes of coal a year for export, it is not clear that the *Montana* PRB would see this same cost increase.

Our conclusion is that there likely would not be as large of a price impact on the PRB as a whole if the coal for export through PNW coal ports comes from the Montana portion of the PRB (as it does in the DEIS in all circumstances when sourced from the PRB). These continuing low PRB coal prices would support less fuel substitution as coal prices rise relative to the price of natural gas if the coal comes from Montana rather than the southern PRB. As our discussion above shows, if the coal was to come from the PRB in general, then the price increase that is predicted in the DEIS, that drives domestic coal consumption down and encourages fuel substitution which drives GHG down in the U.S., would not happen as a result of exporting 44 million metric tonnes. The last important piece is that like the delivered price of PRB coal to Asian markets, the delivered price of PRB coal to domestic markets is predominately made up of shipping costs and not mine mouth prices. This would indicate that there would be less of a chance of fuel substitution within the domestic market even if Montana PRB coal being exported to Asia caused a modest rise in the Montana PRB coal price because of the historically limited market for Montana coal.

4. More realistic accounting of emissions

Recall from Part V.3 of these comments, that the DEIS modeling projects PRB coal supply costs to rise much more rapidly than the EPA coal supply curves support. In fact, given the volume of coal derived from the PRB modeled in each scenario,[139] there should be *no change in price* between modeled alternatives in the DEIS model.[140] This indicates that, without the Uinta Coal basin even being considered, the PRB should absorb the increase in mining which would accompany the proposed Longview coal port without significantly increasing the total cost of coal domestically. This is especially true since the majority of the coal that could possibly price into the Asian markets would need to be sourced from the Montana portion of the PRB.[141] As we have already stated, the shipping advantage that the Montana PRB has over the Wyoming PRB internationally is generally a disadvantage domestically. This simple fact supports our assertion that the domestic price increase of coal assumed in the IPM model is inflated compared to the EPA supply curves.

Since the reduction in U.S. coal is overstated in the DEIS, the emissions impacts for the modeled scenarios is understated in the DEIS. When the reduction of emissions from the U.S. are removed from the DEIS results, a more accurate portrayal of the true impact of the proposed Longview coal port are apparent. Table 4, below, summarizes this more accurate accounting of the emissions directly from the combustion of induced international coal as it was modeled in the DEIS. From this Table, we consider the 37.59 MMtons of annual emissions associated solely with the combustion of induced international coal in the DEIS Upper Bound scenario to be indicative of a scenario which would more aptly represent the upper bound.

Table 4.

Total CO2 Emissions from Induced Combustion of Coal (thousand metric tons)								
Scenario	2016	2018	2020	2025	2030	2040	Total 2016-2040	2025-2040 Average
Past Conditions (2014)	0	0	0	2,497	4,059	1,305	45,974	2,554
Lower Bound	0	0	0	2,118	375	667	17,509	973
Upper Bound	-324	-818	0	37,392	36,928	38,298	675,148	37,590
2015 Energy Policy	0	0	0	2,315	1,857	-14	22,619	1,256
Cumulative	0	0	51	3,992	89,857	86,921	1,167,753	64,864
Source: Coal Market Technical Report Tables 40, 56, 72, 85, and 104								

This information reveals that, even in the Lower Bound scenario where the IPM model forces Japan to consume higher cost coal than it otherwise would, thus causing zero induced energy demand in terms of total Btu consumed,[142] there is still the net CO_2 emissions increase equivalent to 0.28 of a coal fired power plant. The CO_2 emissions from the 2015 Energy Policy

[139] From the IPM results the total PRB coal sourced from the PRB (in MMtpy) is 316-357 for the Past Conditions (2014) scenario, 216-312 for the 2015 Energy Policy scenario, 310-388 for the Cumulative scenario, 388-427 for the Upper Bound scenario, and 243-286 for the Lower Bound scenario.
[140] Based on the step-function EPA Base Case v.5.13 coal supply curves.
[141] The IPM results show that between 50% and 100% of the coal that is assumed to flow through the Longview coal port is sourced from one model supply basin/coal type (Montana, Powder River Basin coal grade SA), depending on the scenario modeled.
[142] IPM model results for Lower Bound scenario induced consumption in Btu.

scenario is equivalent to more than 1/3 of a coal fired power plant, and the Upper Bound scenario emissions are equivalent to 10.9 coal fired power plants.[143]

Part VI: The Longview DEIS Does Not Treat Asian and Domestic U.S. Coal Markets Symmetrically in Its Modeling of the Carbon Pollution Impact of the Longview Port

Unlike the DEIS's assumptions for Asia, a zero price elasticity of demand for coal and electricity is assumed for the U.S. coal markets. Only the cross-elasticity with natural gas/renewables is assumed to operate in the U.S. On the other hand, no cross-elasticity with natural gas/renewables is assumed in Asian nations. This leads to an underestimate of the increase in GHG in Asia and an underestimate of the GHG *declines*, in the U.S. Without explicit modeling of these impact, we do not know in what the magnitude of this bias in the DEIS estimates of net GHG impacts is but we do know the direction.

1. Lack of cross elasticity in Asia.

The single largest emissions *reduction* that we see in the DEIS modeling is from a switch toward natural-gas-fueled and renewable electric generation and away from coal-fired generation in the U.S. This happens as more U.S. coal is mined and exported to Asia resulting in an increase in the cost of mining coal in the U.S. As the price of coal in the U.S. increases, the cost of natural gas becomes cheaper relative to coal. While the concept of cross-elacticity is well documented, the assumption of coal price increases are not correct for the reasons discussed above. Because natural gas has about half of the emissions (on an energy basis) when compared to coal, there are fairly significant GHG savings associated coal's assumed relative cost disadvantage. As the DEIS describes it:

> *"The decrease in coal combustion due to higher coal prices is partially offset by natural gas combustion in all but the 2015 Energy Policy scenario. In the other scenarios, the coal is replaced by natural gas, which has a lower combustion emission factor, causing a net decrease in domestic electricity generation emissions."*[144]

This is a result that the IPM model has predicted before.[145] This is also a logical result of a relative increase in price of coal compared to natural gas. As we have shown above, the price of natural gas, on an energy basis, when compared to coal, is currently very close. As we have also shown, the U.S. has been actively moving towards the use of natural gas since the early

[143] EPA. GHG Equivalencies Calculator-Calculations and References. https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references
[144] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Greenhouse Gas Emissions Technical Report. Page 3-10.
[145] Rulemaking for Colorado Roadless Areas. Supplemental Draft Environmental Impact Statement. November 2015. Appendix E: Economic Analysis Methodology. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd485194.pdf

2000s with very large increases in the amount of installed natural-gas-fueled electric generating capacity. As we have also shown the switching point from coal to natural gas is not always driven by the relative fuel costs on an energy basis. Government policies can try to move electric generation towards lower emissions by changing fuel sources. This is not a decision that only the U.S. is making as shown by China's thirteenth 5 year plan and Japan, South Korea, and Taiwan's current reliance on natural gas for producing electricity, as discussed earlier.

Since the cross elasticity of gas and coal is included in the DEIS modeling of the U.S., it should also be included in Asia. At this point this is a conceptual argument because to our knowledge[146] the DEIS did not consider the cross elasticity of coal and natural gas/renewables in Asia. However, as we have laid out above in our discussion of the four largest coal consuming nations in Asia (China, Japan, South Korea, and Taiwan) that are close enough to receive coal from the proposed Longview coal port, there is both installed capacity to burn natural gas (often LNG) and government policies being enacted to encourage the use of natural gas to lower each country's emissions.

If these same Asian countries are receiving coal that reduces the cost of generating electricity, then those Asian countries will see the opposite effect that is modeled here in the U.S. in the DEIS: Asian emissions will increase as coal becomes cheaper relative to natural gas. Not only will they burn more coal than they otherwise would have (induced demand associated with the elasticity of demand for coal), but they will burn less natural gas than they otherwise would have.

We are not suggesting that the modeling is fatally flawed because of this omission. We are suggesting that the highest emissions that are forecasted in the model should be viewed as conservative estimates because there are likely more emissions than were modeled in the DEIS. If they had considered the cross elasticity of demand for coal and natural gas/renewables, then more coal and less gas/renewables would be consumed to create electricity in Asia.

2. Elasticity of demand in the U.S.

The DEIS calculated an elasticity of demand for coal in Asia. This is a major step forward in their modeling efforts and one that we have been advocating for.[147] In the Upper Bound scenario there is more coal that is burned, and more electricity that is produced, than would have been without the proposed port. The drop in delivered price of coal in Asia allows Asia to use more electricity than they otherwise would have without the port. Asia begins with an energy target for each scenario, and then that energy target is adjusted to account for the induced demand that was created by the lower delivered cost of coal due to the importation of U.S. coal. This is an important economic principle that has not been applied by ICF in their IPM modeling before.

[146] There is no mention of cross-elasticity in any of the publically available documentation of the IPM
[147] Rulemaking for Colorado Roadless Areas-Supplemental #46470. Comments submitted on 1.15.2016 by Thomas Power on behalf of Power Consulting. https://cara.ecosystem-management.org/Public/Letter/952146?project=46470

What is missing is the same demand response here in the U.S.[148] If the price of coal goes up in the U.S. and we are forced to rely on more costly energy sources for our electricity, then we would expect that we would use less electricity than we otherwise would have without the proposed exports through the Longview port. Again, this is the opposite effect that we see from the modeling in Asia. Exports through the proposed Longview coal port are assumed to drive U.S. coal mining costs up, making the generation of electricity in the U.S. more costly. This should induce a drop in the demand for electricity. If there is less electricity generated then there should be less fossil fuels burned and less GHG associated with the production of electricity. This demand reduction should be included in the DEIS modeling of the market adjustments just as it was used in Asia. Of course, as we have emphasized above, the impact of the proposed Longview coal port on PRB coal mining costs will be much lower than the DEIS estimated or non-existent if the lower cost coal in Montana is the source of the coal that services the proposed coal port as it currently is in the IPM modeling.

VII. The Coal Market and GHG Modeling Carried out by ICF using the IPM presents reviewers of the DEIS with a Non-Transparent "Black Box," Preventing Any Careful Review of the Inputs, Analytics, or Outputs of That Modeling

Without basic information on the specific inputs or outputs of the model, the black box nature of the IPM makes independent review of the modeling and resultant analysis of the model results impossible. Although the volume of information given in the DEIS is substantial, the content of the information included within the DEIS is insufficient for the careful, independent analysis of the DEIS and its conclusions.

In separate requests for more complete information on the IPM results, Power Consulting and Earthjustice received responses claiming that the information in the DEIS was ample. The exact response from the Washington Department of Ecology was:

> *"The data, information, and assumptions that ICF used in doing the coal market assessment are described in considerable detail in the assessment report and DEIS. Most of the data they used came from publicly available sources that are cited in the text and in the references. There is also considerable information available regarding the IPM model itself, since it is used by EPA for various purposes. Consequently, Ecology does not believe it is accurate to describe the model as a "black box." Your experts should have enough information from the report and DEIS to provide meaningful comments.*

[148] Multiple studies corroborate the conclusion that IPM does not allow for electricity demand adjusting to changes in the price of electricity. Jaglom, W. S., McFarland, J. R., Colley, M. F., Mack, C. B., Venkatesh, B., Miller, R. L., Haydel, J., Schultz, P.A., Perkins, B, Casola, J, Martinich, J.A., Cross, P., Kolian, M.J., and Kayin, S. (2014), Assessment of projected temperature impacts from climate change on the US electric power sector using the Integrated Planning Model®. *Energy Policy*, *73*, 524-539. And McFarland, J., Zhou, Y., Clarke, L., Sullivan, P., Colman, J., Jaglom, W. S., Colley, M., Patel, P., Eom, J., Kim, S.H., Kyle, G.P., Schultz, P., Venkatesh, B., Haydel, J., Mack, C., and Creason, J. (2015), Impacts of rising air temperatures and emissions mitigation on electricity demand and supply in the United States: a multi-model comparison. *Climatic Change*, *131*(1), 111-125.

> *With respect to your specific request for the modeling spreadsheets, Ecology is discussing the request with ICF and will get back to you. ICF regards some of their spreadsheets as proprietary and as such they may not be disclosable."* [149]

In this section, we show that the IPM is a "black box" model, meaning the publically available documentation does not describe the equations used in the model, the exact assumptions and constraints placed on the model, or how the equations are implemented in the model.[150] We also show that the information provided within the DEIS is not sufficient to provide a meaningful assessment of the results presented by the DEIS.

1. The "Black Box" nature of the Integrated Planning Model

In their assessment of the proposed Longview coal port, Ecology hired ICF to model the economic viability and emissions impact of the port. ICF used its proprietary energy economy model called the Integrated Planning Model (IPM) in this assessment. The IPM is a proprietary model developed by ICF International (originally Inner City Fund) to support government and industry analysis of the U.S. and global electric power sector. The IPM is a linear programming (LP) model that employs commercial grade LP solvers to minimize an objective function[151] while adhering to a series of constraints and decision variables; this is more generally referred to as optimization. Specifically, the IPM calculates the mix of energy generation and transmission that meets a constant electrical demand at the lowest total cost while adhering to physical and regulatory limits. The IPM constructs a sophisticated representation of the supply side of the energy economy[152] for the United States with international fuel trading also considered. It incorporates representations of fuel extraction, transportation, and different sources of electrical generation into the model.

Recall that publicly available documentation of the IPM is limited; the most thorough publicly available description of the model is published by the U.S. Environmental Protection Agency

[149] Email from Tom Young, WA Attorney General's Office to Jan Hasselman, Earthjustice 5/5/2016. Eventually we were provided with data which should have been included in the DEIS. This data was delivered on 6/1/16, 12 days before comments on the DEIS were due.

[150] The means by which the equations within the model are implemented will affect the model results. For example, there is no discussion of how the IPM implements the calculation of price elasticity of demand in any of the publically available documentation. The effect of the price elasticity of demand must be calculated as an iterative product. This means that the change in demand (in Btu) must be calculated from the average price of coal (in $/Btu) for each demand region in each year; the adjusted demand must be used as the new model input demand and the model must be run again to determine the price of coal at that demand level. This process must be repeated until the change in the price of coal does not change from one iteration to the next (the model converges on a solution). The convergence tolerance is a user defined number in most models.

[151] In this case, the objective function is the total cost of energy production in the modeled demand regions.

[152] The term energy economy encompasses all of the portions of the economy that relate to the generation or consumption of energy. The energy economy can be divided into two separate categories: the supply side of the energy economy and the demand side of the energy economy. The supply side encompasses all parts of the energy economy that are involved with the production and distribution of energy including extraction (i.e. coal mining, oil extraction, natural gas extraction, etc.), generation, and distribution of both physical commodities such as coal and oil as well as transmission of electricity. The demand side of the energy economy encompasses all parts of the energy economy that are involved with the consumption of energy including direct fuel consumption (i.e. fuel used in electric generation and transportation or gas used in heating, etc.) as well as the consumption of electricity by the residential, commercial, and industrial sectors.

(EPA). The EPA uses the IPM in analysis of regulations and legislative proposals.[153] The IPM works well for these analyses because the IPM represents the supply side of the energy economy with a relatively high degree of geographic detail. This high degree of geographic detail results in a precise analysis of the effects that federal as well as local regulations may have on the geographic pattern of emissions and other factors within the energy economy such as the price of energy or the mix of energy sources needed to meet a specified amount of demand. However, the use of IPM outside of this specific EPA framework is "black box" modeling without the possibility of independent verification since the model results cannot be independently reproduced or even checked.[154] As the EPA states:

> *"ICF Resources, Inc. maintains an IPM user manual for the purpose of training internal staff and licensees of the model. Since it contains proprietary business information pertaining to the source code, it is not available for public dissemination."*[155]

The black box nature of both the model as well as the results of the model is especially disconcerting because the IPM is a deterministic model wherein each implementation of the IPM requires a set of inputs and assumptions that directly affect the results of the model.[156] As Jaglom et al. (2014) state, "[the] *IPM is flexible with respect to data and input assumptions. In general, all inputs to the model are user-defined and case-specific and reflect the specific policy, physical conditions, or market conditions being analyzed*."[157] Unfortunately, the data and input assumptions that the ICF use in their modeling of the Longview coal terminal are not well defined in the DEIS. Instead ICF states that:

> *"Although this documentation provides insight into EPA's assumptions, the data and assumptions used by ICF in this analysis are not necessarily the same as used by EPA. However, ICF did use many of the EPA assumptions as described in more detail in Section 4.2."* [158]

In Section 4.2 of the DEIS states that:

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[153] EPA Power Sector Modeling web page accessed on 9/9/15 at: http://www.epa.gov/powersectormodeling/ . Starting 10/1/15 the page will be hosted at: http://www.epa.gov/airmarkets/powersectormodeling.html.

[154] ICF considers the specific results of the IPM proprietary. ICF routinely performs "*Quality assurance and verification*" of the code. However, the license cost of the IPM is hundreds of thousands of dollars (personal communication with an ICF Senior Technical Specialist) making external verification of the IPM out of reach for most private organizations.
EPA Science Inventory Integrated Planning Model – EPA Applications. Accessed on 9/9/15 from: http://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=74919&CFID=37279577&CFTOKEN=14581785

[155] EPA Science Inventory Integrated Planning Model – EPA Applications. Accessed on 9/9/15 from: http://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=74919&CFID=37279577&CFTOKEN=14581785

[156] The IPM is a deterministic model. This means that if the objective function is minimized to within a certain limit, the IPM will provide an output. This also means that, if unrealistic assumptions are imposed in the model domain, the model will output unrealistic results. For example, all of the scenarios proposed in the DEIS assume 44 million metric tons of coal per year is exported through the Longview terminal starting in 2025 even though the domestic coal is not price competitively in all of the scenarios, suggesting that there often is not a market for that coal internationally.

[157] Jaglom, W. et al. (2014). Assessment of projected temperature impacts from climate change on the US electric power sector using the Integrated Planning Model®. *Energy Policy*, *73*, 524-539.

[158] Coal Market Assessment Technical Report, page 4-4

> *"To the extent possible, assumptions from publicly available sources, such as the EIA, IEA, and EPA were used. The majority of assumptions were obtained from EPA's v5.13 IPM Base Case (2013)."* [159]

Within this section, the DEIS describes assumptions including coal supply curves, international coal demand, domestic natural gas price versus demand relationships, as well as the volume, timing, and source of proposed coal exports through the Longview coal port.[160] Unfortunately, some of the most important assumptions and data that are included in the IPM scenarios presented in the DEIS are neither publically available nor are they given in the DEIS. Since the IPM documentation and the DEIS do not thoroughly describe (1) the exact assumptions of the model, (2) the data input to the model, (3) the equations involved in calculating the results, (4) the methods by which the equations are implemented in the model, or (5) the results of the model, the model is a "black box".

2. The information within the DEIS is insufficient for independent review of the results

In order to independently assess either the economic viability or the emissions impact of the proposed Longview port, the following information is needed for each scenario for each model year:

1. The source and amount of coal delivered to each demand region as well as the Btu content of the coal from each supply region.
2. The delivered price ($/Btu) of the coal for each supply region to demand region combination.
3. The induced demand (in Btu) for each demand region.
4. The distance estimate from each supply region to each demand region.

a. Results in the DEIS are presented in units that are ambiguous; the results need to be presented in terms of Btu.

Almost all of the IPM results presented in the DEIS are provided in terms of millions of metric tons of coal per year (MMTons/year). This is an ambiguous unit to describe the induced demand for energy, even where the demand is expected to be derived solely from coal. Recall, that the most comprehensive documentation for the IPM is the EPA documentation. Within the EPA documentation, there are 58 coal supply region/coal grade classifications that are either sub-bituminous or bituminous,[161] the heat content of these defined coal region/grades ranges from 15.00 MMBtu/ton to 25.90 MMBtu/ton.[162] If we assume that this is representative of the variation

[159] Coal Market Assessment Technical Report, page 4-4
[160] The DEIS also briefly describes assumptions about domestic reserve margin targets, domestic mothballing and retirement of electrical generating plants, domestic transmission of electricity, limitations on the type of coal allowed to ship internationally, domestic and international coal reserve estimates, as well as regulations pertaining to air, waste, water, and renewable energy. Coal Market Assessment Technical Report, page 4-4 to page 4-13
[161] There are also 13 Lignite coal supply region/coal grade classifications listed in the EPA documentation of the IPM.
[162] U.S. Environmental Protection Agency. Documentation for EPA Base Case v.5.13 using the Integrated Planning Model. EPA # 450R13002. November, 2013 http://www.epa.gov/airmarkets/documents/ipm/Documentation.pdf

in international heat content, to meet the projected 2018 thermal demand of Japan (3,182 Trillion Btu) in the Past Conditions (2014) scenario referred to in the DEIS, Japan would have to burn between 122.9 million tons to 212.1 million tons of coal. The DEIS lists Japan's 2018 thermal coal demand as 136 million tons.[163]

Without the volume and specific coal heat content from each source coal type delivered to Japan, this thermal coal demand given in millions of tons cannot be verified or reproduced with an assumed error less than 44.6 million tons of delivered coal. Therefore, the units that the results are presented in are completely ambiguous in relation to the problem. Similarly, the thermal coal demand for any other demand region (i.e. China, India, South Korea, every domestic coal-fired power plant, etc.) cannot be verified for any given model year. Moreover, neither the economic viability of the Longview coal port, nor the emissions impact of the Longview coal port, nor the induced thermal coal demand can be assessed or independently verified without the specific coal source, region/type, heat content, and volumes delivered to each demand region. The fact that the DEIS does not include the IPM results makes the verification of most of the DEIS tables impossible.

The DEIS recognized this in its interpretation of the reported impacts of the Longview coal port on induced demand for coal in Asia. For example, although Table 30 of the Coal Market Report[164] shows four Asian nations had an increase in coal consumption due to the Longview coal exports lowering the delivered cost of coal in Asia, the DEIS states:

> *"[I]n China under the Proposed Action, coal consumption increases by 2.3 million metric tons in 2025 over the No-Action Alternative; however, the total heat content of the coal consumed remains the same, as does the amount of coal imported (350 million metric tons). This is possible because Indonesia shifts the type of coal exported to China to include 10 million metric tons more subbituminous coal, which has a lower heat content, and 10 million metric tons less bituminous coal, which has a higher heat content under the Proposed Action compared to the No-Action Alternative. Thus, Indonesia is exporting a lower amount of total coal energy to China while still exporting the same total tons of coal (350 million metric tons). China is compensating for the lower delivered heat content by consuming more domestic coal."*[165]

The DEIS also had to inform the reader that *some* of the increase in the MMTons/year of coal consumed by Japan and South Korea represented actual induced demand for energy.[166] These examples of how the DEIS explains that the apparent increase in energy production is not real in the model results, are exceptions; most of the DEIS model results are not discussed. Since the DEIS withholds almost all of the IPM results, and provides the results that they do give in terms of MMTons/year, the total energy derived from any one source is indeterminable. If the DEIS had provided tables showing the consumption of coal in Btu terms rather than MMTons/year, the reader would have been able to determine when there was induced demand that represented actual increased use of energy and therefore, increased GHG emissions. As the DEIS was written the actual information of induced demand and how it was calculated is never provided.

[163] Coal Market Assessment Technical Report, page 4-17
[164] Coal Market Assessment Technical Report, page 6-15
[165] Coal Market Assessment Technical Report, page 6-16
[166] Coal Market Assessment Technical Report, page 6-14 and 6-16; for another example of where increases in consumption means decreases in energy use and *vice versa* see p. 6-27 of the Coal Market Assessment Technical Report.

b. The relative delivered price of Longview exported coal vs. international coal is the driving force for the economic viability of the Longview coal port, yet delivered price of coal is not provided in the DEIS

The delivered price of coal is not given in the DEIS; neither is there sufficient data within the DEIS to independently determine and/or verify the delivered price of coal. This is a problem since the economic viability of the Longview coal terminal and the emissions impact from the induced energy consumption from the proposed terminal are directly related to the delivered price of coal from international and domestic sources. If Longview exported coal is not price competitive with international coal, there will be no market for the coal that is assumed to be shipped through the Longview coal port.

Here we detail the coal price data given in the DEIS as well as the inconsistencies in the data which serves to confuse the reader. We also suggest the appropriate data that should be supplied in the DEIS in order to allow a thorough, independent review of the IPM results which are qualitatively discussed in the DEIS.

i. Domestic coal prices

Projected domestic Free on Board (FOB) coal prices for each supply basin are a result which the IPM calculates for each scenario. The domestic FOB coal prices are derived from the coal supply curves from each supply basin.[167] Within the IPM, the Uinta coal basin is divided into three modeled supply regions,[168] the Powder River Basin is also divided into three modeled supply regions.[169] These six regions have a total of 9 coal types associated with them.[170] In Table 12 of the Coal Market Technical Report, the projected results for the coal prices in the Past Conditions (2014) Scenario – No-Action Alternative are given for 4 of these 9 domestic coal types that are allowed to be exported via the Longview coal port, meaning that most of the domestic coal that is modeled has no price at all given in the DEIS. The coal supply curves from which these coal prices are derived are publically available.[171] However, the price of each coal source region/type is dependent on the volume of coal sourced from that region, thus, without the volume and price of coal delivered from each source region to each demand region, the domestic coal FOB and delivered prices cannot be determined or verified.

Table 31 of the Greenhouse Gas Emissions Technical Report (page 2-32) *"summarizes the differences in carbon and heat contents among the coals assessed in the coal market assessment."* It is unclear if this means that these are the only coals assessed in the market assessment or if these are among the coals assessed in the market assessment. If these are

[167] Coal supply curves describe the relationship between volume of coal produced in a region and the miing cost per ton of that coal. In general, as the volume of coal produced at a certain mine increases, the FOB price of that coal also increases. The coal supply curves used in the IPM are a combination of the individual step function coal supply curves for the region. Capital costs are not included in the EPA base case 2013 supply curves. From: U.S. Environmental Protection Agency. Documentation for EPA Base Case v.5.13 using the Integrated Planning Model. EPA # 450R13002. November, 2013 http://www.epa.gov/airmarkets/documents/ipm/Documentation.pdf

[168] These model supply regions are labeled UT, CU, and CG (which also incorporates the Colorado portion of the Greater Green River Basin) in the IPM model documentation. Coal Market Assessment Technical Report, Figure 17, Page 4-15.

[169] These model supply regions are labeled MP, WL, and WH in the IPM documentation. Coal Market Assessment Technical Report, Figure 17, Page 4-15.

[170] Op. Cit Documentation for EPA Base Case v.5.13.The 9 coal types are: UTBA, UTBE, CUBB, CGBB, CGSB, MPSA, MPSD, WLSB, and WHSA. From: Table 9-24 Coal Supply Curves in EPA Base Case v.5.13

[171] https://www.epa.gov/airmarkets/documentation-base-case-v513-coal

the only coals assessed in the market assessment, then, according to the DEIS, the FOB price given for one of the Powder River Basin coals and both of the Uinta Basin coals are not modeled.[172] If they are not the only coals assessed in the market assessment, then the domestic price data provided in the Market Assessment is incomplete. Either way, there is a discrepancy between the EPA Base Case v.5.13 Supply Curve[173] heat content data and the information provided in Table 31 of the Greenhouse Gas Emissions Technical Report.[174] This discrepancy, in conjunction with the fact that almost no price data is given for U.S. coal, is disconcerting at best. The meaning of this is that either (1) the IPM is calculating the incorrect heat content for the coal types, (2) the IPM is using incorrect emissions factors for the coals, or (3) that the DEIS is incorrectly reporting the results of their modeling efforts. Because the IPM is a black box model and the results of that model are proprietary, we cannot determine which of these three explanations is correct.

ii. International coal prices

The DEIS has even less information on the price of international coal modeled in the IPM than price information for U.S. coal. International coal supply curves *"were developed for each of the international supply regions used in the model, except for Canada."* [175] This means that the input data for all of the supply regions were constructed by ICF, yet none of the data for the international supply curves is provided in the DEIS. Again, the black box nature of the IPM as well as the proprietary nature of the results of the IPM means that these supply curves could be almost anything. All that we know about the international supply curves is that they *"were adjusted over time at the average rate that the EPA domestic supply curves were adjusted."* [176]

The DEIS does qualitatively allude to some current and historical prices of international coal. Historical Free On Board (FOB) coal prices are shown in Figure 14 of the Coal Market Assessment Technical Report for Newcastle 6700 kc GAD, Indonesian HBA 6322 kcal, Qinhuangdao 5800 kc NAR, and Richards Bay 6000 kc NAR coal types. The DEIS recognizes that these historical FOB coal prices, that are shown in $/MMBtu, do not represent the true equalized value of these different coals. the DEIS states that:

> *"The coal prices in Figure 15 are not adjusted for the coal moisture content because coals are reported as gross air-dried, gross as received, and net as received."* [177]

This means that the prices shown in Figure 15 are not the true price per MMBtu, since the moisture content of the coals affects the final heat content of the coal. It is clear that ICF did not use this data as they are reported in the DEIS to develop the international coal supply curves

[172] The heat content values for the CO Uinta, UT Uinta, and MT Powder River Basin coals in Table 31 of the Greenhouse Gas Emissions Technical Report and Table 12 of the Coal Market Assessment Technical Report are not the same. Further, the heat content of all three coal types given in the Greenhouse Gas Emissions Technical Report are inconsistent with the Coal Supply Curves for EPA Base Case v.5.13.
[173] Page 4-5 of the Coal Market Analysis Technical Report states: *"For this analysis, coal supply curves from EPA's v5.13 IPM® case were used."* We obtained these coal supply curves from EPA.
[174] The heat content given for MT Powder River Basin and UT Uinta coals do not match ANY heat contents published in the supply curves; the heat content given for CO Uinta coal matches AZBB coal type, a bituminous coal from Arizona with 0.81-1.20 lbs SO_2 content per MMBtu.
[175] Coal Market Assessment Technical Report, page 4-5
[176] Coal Market Assessment Technical Report, page 4-5
[177] Coal Market Assessment Technical Report, page 3-8

used in the IPM. If they did use this data, the international coal supply curves are not comparable when assessing the viability of coal from any region pricing into the market.[178]

The DEIS also qualitatively describes the historical international prices in relation to the projected Powder River Basin coal prices by stating:

> *"The most recent peak in prices was in early 2011 at about $5/MMBtu. Since then international coal prices have dropped by 50% to around $2.5/MMBtu. Powder River Basin coal shipped through Vancouver, British Columbia or other Pacific Northwest ports would have an FOB cost of close to $2.9/MMBtu in 2015, making it somewhat higher than the Pacific Basin 2015 coal prices."* [179]

This means that under current market conditions, the Powder River Basin coal is not economically viable in the Asian market. Estimated delivered price of coal to Japan from two coal types sourced in the Powder River Basin are also given in Table 8 of the Coal market analysis. This table uses illustrative mine mouth coal prices and illustrative heat contents to show the difference in delivered prices from Vancouver and the proposed Longview coal port in $/MMBtu. However, the only thing this table actually shows is the difference in total transportation cost between the Powder River Basin regions and the coal terminals, since all of the other variables are the same.

The driving force behind adjustments in the consumption of coal is changes in the delivered price of coal in the analysis of both Asian and U.S. coal markets. In Asia, exports from the Longview coal port are assumed to lower Asian delivered coal prices and induce additional consumption of coal energy. In the U.S., increased mining levels are assumed to cause the cost and price of coal to rise, discouraging the use of coal energy. Since the DEIS never reports what the delivered coal price changes are, it is not possible to evaluate the reasonableness of the reported changes in actual coal energy use both domestically and internationally.

3. Description of why the information is needed for independent verification of the IPM results

Because the IPM models each coal-fired electric power plant as a separate demand region domestically and each country as a separate demand region internationally, we collectively refer to domestic coal-fired power plants and other countries as demand regions in the discussion.[180] Likewise, we collectively refer to the 34 domestic coal basins and the 25 international supply basins as supply regions.

a. The source and amount of coal delivered to each demand region as well as the Btu content of the coal from each supply region.

Within the DEIS, delivered coal for each country is given in millions of tons. However, energy consumption is not directly related to the weight of coal; it is related to the energy that is available to be released from the coal. Because each demand region gets coal from multiple

[178] The historical prices for are not comparable since they are reported in three different Btu content units: Gross as Delivered (GAD), Net as Received (NAR), and kilogram calories (kcal). Coal Market Assessment Technical Report, page 3-8
[179] Coal Market Assessment Technical Report, page 3-8
[180] This is consistent with the publicly available IPM documentation.

supply regions and each coal type from those demand regions has a different average heat content, the total weight of the coal delivered is not indicative of the total energy content of that coal. There is a large difference in the energy content per ton of coal between Newcastle coal and Richards Bay coal, yet there is no differentiation between these coals in the reported quantity of tons of coal delivered in the DEIS. Within the IPM framework described in the DEIS and EPA documentation, there are 885 potential coal source/type combinations.[181] It is apparent that the number of coal source/type combinations in the IPM is less than this since not all 15 coal types are found in each supply region. However, without Btu content information for all coal delivered to each demand region, it is impossible to determine the total energy of the coal delivered to the demand regions[182] and therefore it is impossible to independently verify the economic viability of the Longview coal port or changes in energy consumption and emissions under any scenario.

b. The delivered price ($/Btu) of the coal for each supply region to demand region combination.

Under an assumption of the absence of long-term contracts with fixed coal prices associated with them, each demand region will source coal from the supply region that allows them to attain the highest Btu content at the lowest cost. Without the delivered price of coal for each supply region to demand region combination, it is impossible to independently verify the economic viability of the Longview coal port or its impact on emissions. As we describe below, the delivered price of coal in $/Btu is data that is necessary to verify the results of the IPM model.

c. The induced demand (in Btu) for each demand region.

The DEIS claims that price elasticity of demand (PEoD) is accounted for with a simple coefficient. It is unclear, however, how they implement the PEoD. The IPM is designed to solve for the mixture of energy sources that meets a certain, fixed energy or electricity demand. However, under the assumption of a fixed PEoD, when the demand for a commodity (in this case energy derived from coal) is increased, the price of that commodity increases. However, as the price of that commodity increases, the quantity of that commodity consumed decreases. A full energy economy model would iterate between the price of the commodity and the quantity demanded for that commodity until the change in either is very small. Thus, IPM must be run multiple times to converge on the final induced demand and in each iteration the delivered price of coal must be adjusted to converge on the delivered price of coal that is associated with the new level of demand, otherwise the IPM solution is incorrect.[183]

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[181] 15 coal types * (34 domestic basins + 25 international basins)

[182] Mathematically, this is an underdetermined problem, meaning that if a solution exists, multiple (perhaps infinite) solutions exist. Without constraining the problem, all of the solutions are equally valid. As a linear programming model, the IPM is well-suited for solving this type of problem. Given certain constraints (such as delivered price per Btu for each coal type for each supply region/demand region combination and total energy required by each demand region), the IPM will find the least-cost solution that satisfies the constraint of energy production in the demand regions. This solution is deterministic, meaning there are no errors or range of solutions that are given in the solution. If a different set of data and constraints are input to the model, the solution will change. In other words, if the projected energy consumption of Japan in 2025 is reduced, the IPM will output a different solution for all regions, not just Japan.

[183] Without modeling the demand side of the economy, which IPM does not currently do, this is the ONLY method of solving this problem.

Induced demand is reported in the DEIS as tons of coal. Recall that the energy content of coal is not uniform across coal types. However, the emissions associated with the combustion of coal is closely tied to the heat content of the coal. Therefore, to independently verify the emissions impacts associated with the induced demand, the induced demand must be given in terms of induced Btu consumption. As Tables 33-47 in the SEPA Greenhouse Gas Emissions Technical Report show, the emissions associated with the induced coal demand are at least an order of magnitude greater than any other source analyzed in the DEIS. For this reason, independent verification of this source of emissions is crucial.

d. The distance estimate from each supply region to each demand region.

As the second largest source of net emissions associated with the Longview coal port, the distance that coal must be shipped from each supply region to each demand region should also be subject to independent verification of the emissions associated with transporting that coal is necessary. Without the distance estimates from supply region to demand region used in the IPM, this verification is not possible.

4. Detailed Results of the IPM modeling

On June 1st, Power Consulting Inc. received ICF's results from the IPM modeling conducted for the DEIS. Section VI.2 of this document detailed both our request and the information that we received. Although this information has been helpful in understanding the modeling that was done in the DEIS, the information came far too late to be analyzed with the scrutiny that should be applied to this decision. The 45 day comment window for any DEIS is a very short time window to allow a reasonable analysis and comment on the merits of the DEIS. Data imperative for the thoughtful analysis and review of the DEIS was only provided to us after multiple requests and only 12 days before the comments were due. We have reviewed this data which has led to a clearer understanding of the modeling that was done with the IPM. However, this data should have been presented to all of the potential commenters when the DEIS was released. Initially when we asked the Department of Ecology for this data our request was denied as detailed above. Eventually, our request was accepted, but the delays in receiving the data were significant. Thus, we present only a cursory review of this data and the modeling that was done using the IPM in this comment.

Key Findings

- The modeling that was done for the DEIS does not assume a "perfect substitution" of PRB coal for coal that otherwise would have been burned. Instead, the DEIS recognizes coal is bought and sold in international and domestic markets where supply and demand interact with each other. This is an important step in the right direction.

- Since a key constraint was placed on the IPM model where coal is forced through the proposed port in all of the different modeling scenarios, it is unclear which of these scenarios is actually economic in a real world setting. The IPM model should have been allowed to choose when and how much coal was exported to Asian markets. Without this scenarios like the Lower Bound, which is clearly un-economic, are presented with equal weight against the only clearly economic scenario, the Upper Bound.

- Since the coal boom times caused by China's decision to switch from being the world's largest exporter to the world's largest importer of coal, the new coal "super-cycle" has not materialized. Instead there has been a rash of bankruptcies with the largest PRB coal companies and a series of port proposals that have not materialized.

- Only the "Upper Bound" scenario is consistent with a commercially viable Longview coal port. It should be labeled the "Commercially Viable Longview" scenario and used as an indication of what the impacts of a commercially viable Longview coal port would be on carbon pollution. As the only commercially viable scenario, it should be considered the most likely and hence replace the 2015 Energy Policy scenario in the DEIS's conclusions about GHG impacts.

- The cost curve for the PRB is extremely flat at current and projected levels of consumption in the DEIS. Because it is so flat the addition of 44 million metric tonnes a year should not cause as large of an increase in the cost domestic coal as is projected in the DEIS. Because there is not as large of an increase in cost there should not be as large of a switch to less carbon intensive sources of fuel domestically which would not offset the increased consumption in Asia as much.

- The DEIS's analysis of market adjustments to the Longview coal port successfully competing for a share of the Pacific Basin coal demand is incomplete and asymmetric in a way that likely leads to an underestimate of the net change in carbon pollution. Specifically, in the analysis of market adjustments in the U.S., the relative price of coal and natural gas/renewables is the sole market adjustment. The full price elasticity of demand for electricity that would include a change in electricity consumption in response to the change in the cost of fuel for electric generation is not included in the analysis. In the analysis of the market adjustments in Asia, the price elasticity of demand for coal is the focus with no consideration of the impact of the change in the cost of coal on the use of natural gas and or renewables to generate electricity. Asia and the U.S. should be treated in the same manner in modeling completed for the DEIS.

- Since the IPM documentation and the DEIS do not thoroughly describe (1) the exact assumptions of the model including the constraints imposed, (2) the data input to the model, (3) the equations involved in calculating the results, (4) the methods by which the equations are implemented in the model, or (5) the results of the model, the model is a "black box" that public decision-makers and citizens cannot evaluate for appropriateness, accuracy, or bias. Although ICF did supply Power Consulting with the detailed results that we asked for, those results were not provided early enough for the careful review that should have happened. The detailed results should be provided to

everyone at the beginning of the comment period so that a careful and thorough review of the results can be conducted by all interested parties.

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Appendix A: The Cost of PRB Coal Delivered to Asia

One of the basic assumptions in the DEIS is that Western U.S. coal will be competitive in Asian markets. ICF uses their proprietary model (the IPM) to show the impacts of U.S. coal being sent to Asia out of the proposed Longview coal port. What is not immediately clear from their modeling is that there is a constraint in the model that forces the coal to be sent out of the Longview port at its maximum capacity (44 million metric tonnes) starting in 2025.[184] We cannot tell if without a constraint that forces the coal out of the proposed port, would the model predict that any coal would be exported out of the port in the different scenarios outside of the Upper Bound.

Before analyzing the results of the different scenarios, it is important to understand where the international coal market is right now and how that compares to the assumptions in the DEIS. We will begin with a breakdown of the current ability of PRB coal to price into Japan's coal market. We choose this Asian market because it requires the shortest amount of shipping to get the coal from the PRB to the Asian markets. ICF's IPM recognized this as it has the majority of the coal exported through the Longview port going to Japan in in most of the scenarios.

a. The cost of PRB coal

As will be shown in more detail in part b of this Appendix, there is a significant distance advantage for Montana PRB coal over Wyoming PRB coal in delivering coal to Asia. Because of this advantage, we assume that the coal that would be shipped to the Pacific Northwest port would be Montana PRB coal. PRB coal is currently selling for $9.35 a ton[185] and has been hovering in this range since 2012.[186] The U.S. Surface Transportation Board's Tongue River Railroad DEIS assumed that the coal that would come out of the proposed Tongue River coal deposits would sell at PRB market costs which are similar to many other Montana PRB mines.[187] For the purpose of these comments, we assume that the coal that would be shipped to Asia from the Montana PRB would sell at $10 per ton at the mine mouth. Note that the current spot price as well as the assumed price of $10/ton is significantly cheaper than the DIES assumes.[188] This $10 price is well within the historical context for PRB coal. PRB coal has been hovering around this price level for the last 15 years and at this price the recoverable coal in the PRB is10 billion tons, a 20 year supply at a 500 million tons per year mining rate in the PRB. See Figure 2 above.

b. Rail distances and costs to the PNW

We first should distinguish between the different producing regions in the PRB. BNFS Railroad provides a rail distance calculator which allows the calculation of the distance between the different producing Montana PRB mines to determine an average distance to the Longview port.

[184] This is shown in the Lower Bound scenario results where the delivered price of U.S. coal is at least $0.5 per MMBtu greater than any other coal source delivered to Japan in all model years.
[185] Price as of May 20, 2016. EIA. Average weekly coal commodity spot price. http://www.eia.gov/coal/markets/
[186] EIA. Coal markets archive. http://www.eia.gov/coal/markets/
[187] Surface Transportation Board. Tongue River Railroad DEIS. Appendix C. C.6-1. April 2015.
[188] The DEIS assumes that the cost of production for PRB coal is between $15 per ton for Montana PRB coal and $13 per ton for Wyoming PRB coal. Table 10.

Compared to the southern PRB, the Montana portion of the PRB, which has 215 billion tons of coal,[189] is closer to the Longview coal port and other proposed PNW ports[190] by 70-200 miles (depending on which mines are assumed to supply the coal). While this may seem like a negligible distance advantage for Montana PRB coal relative to the southern PRB coal, it represents a $2 to $4 per ton advantage.[191] If we assume that the cost of shipping by rail on BNSF Railroad is $.017 per ton-mile and that the distance is 1185 miles,[192] then the cost to ship from the PRB to a port in the PNW is $20.14 per ton.[193] In the DIES it is assumed that the coal will be shipped for $.0249/ton which would peg the shipping costs at $30.65. Even the significantly lower rate that we present is likely an overestimate since it is a quote from several years ago that likely had a fuel surcharge associated with it. Since we know that right now BNSF is not charging that fuel surcharge because the price of diesel is so low, we feel confident that this is an appropriate estimate of transportation costs.

This allows us to put the mine mouth cost of the coal ($10/ton) and the rail shipping cost together ($20.14 per ton) to come up with a delivered price to a PNW port of $30.14 per ton. We assume, given the shorter distance and the recent coal export from Montana, that Montana PRB coal would be preferentially chosen to be shipped out of the proposed PNW ports. If the southern PRB is preferentially chosen, then a $2-$4 per ton price should be added to the delivered price at the U.S. west coast coal ports. Our price to deliver coal to the MLBT of $30.14 per ton is significantly lower than the DEIS estimate of $43.65-$45.65.

c. U.S. port fees

The third piece of this puzzle is the port loading fees. The issue of U.S. port fees is complicated given that the major investors in the proposed Longview coal port are coal companies. Those companies certainly could preferentially select for their coal if the demand was high enough. Since we do not know what those coal companies might “charge” themselves and if the coal port used was changed the potential rail distances would also change, we defer to other’s estimates of the port fees. Table 4.2 of the Tongue River Railroad DEIS (appendix C.) assumes a port fee of $11 per ton.[194] This is the same port fee cost that was assumed in the DEIS. This

[189] USGS. Assessment of Coal Geology, Resources, and Reserve Base in the Powder River Basin, Wyoming and Montana. February 2013. http://pubs.usgs.gov/fs/2012/3143/fs-2012-3143.pdf

[190] BNSF 6003 Rail Miles Inquiry. http://www.bnsf.com/bnsf.was6/RailMiles/RMCentralController

[191] This is dependent on the cost per ton mile that is charged by Burlington Northern Santa Fe (BNSF) Railroad. Rail costs per ton mile out of the PRB are assumed to be 1.5 cents per ton-mile. This rate comes from Richard McAllister. Briefing Paper-Coal Exporting Terminals. Western Interstate Energy Board. This value is consistent with EIA Surface Transportation Board data from 2001-2009 (document is no longer available) for PRB shipments to western U.S. states. Those costs range between $.01 and $.02 per ton mile. EIA. table 11. Estimated rail transportation rates for coal basin to state, STB data. 9.16.2012.

[192] This is the average rail shipping distance from the five current Montana mines (Absaroka, Decker, Otter Creek, Spring Creek, and Signal Creek) to the proposed Millennium Bulk Terminals location according to the BNSF rail calculator. This is very close to the distance that is assumed in table 7 of the Coal Market Assessment Technical Report presented by ICF in the DEIS. In that table they present the miles as 1,231. Since we do not know where the coal will come from in Montana we will use our very similar estimate.

[193] This rail shipping rate is very close to the assumed rate that was used in The Tongue River Railroad DEIS. Appendix C table 4.2 has the rail shipping rate with a fuel surcharge at $.017 per ton-mile. Since it appears that BNSF is no longer imposing a fuel surcharge (the price of diesel is below $2.50 a gallon) our $.015 per ton mile rate seems appropriate. https://www.bnsf.com/customers/pdf/coal2-mb-program-details-and-table.pdf

[194] Surface Transportation Board. Tongue River Railroad DEIS. Appendix C. Table 4-2. April 2015.

coal loading cost is in the same ballpark as that implied in Westshore's annual report[195] that shows that they shipped 28.85 million tonnes of coal and made $320 million (Canadian $). Adjusting for U.S. short tons and the Canadian dollar compared to the U.S. dollar over 2015,[196] the implied terminal loading fee would be $8.05 per ton. There is some question as to whether or not a new port would be able to charge such a low fee given their recent heavy investment in the facility. Here we assume that a new port would charge a fee similar to the already established Westshore shipping facility so that they could be cost competitive with them.

Since Westshore is essentially full and has put off plans to expand their facility, it is possible that the Longview port would be able to charge a higher fee for their coal since there may be essentially no other option for coal shippers. Cloud Peak signed into a financially burdensome "ship or pay" agreement to gain access to Westshore. However the Longview coal port is being built by coal companies that we assume would minimize their costs as much as possible so that they could attempt to compete in the Asian markets. For these reasons, we feel that our estimate is a low estimate of the port fees to ship Montana PRB coal out of the proposed port.

d. Ocean shipping costs

The Surface Transportation Board's Tongue River Railroad DEIS cites shipping costs from the PNW to Japan at $14.75 per ton[197] which is similar to the DEIS cost to ship of $11.88 per ton.[198] This is *significantly* more than current reported shipping rates. Using the current cost of a Capesize bulk cargo vessel which can handle 150,000 metric tonnes of coal[199] and is currently charging $5,000 a day for the 33 day round trip, the shipping would cost about $2.60 per ton.[200] Even if we assume that the rate is $10,000 a day, which it has not been since 2014[201], the cost would still only be $3.70 per ton.[202] Given that the average daily operating cost that a ship needs to cover each day to break even is $8,000,[203] the dry bulk shipping market appears to currently be in real trouble. As one article put it this "horror" currently has no end in sight as China has dramatically cut back their dry bulk imports.

Since shipping costs are made up of two main components (the fuel costs and the ship hiring costs) and both of those costs have fluctuated wildly in the recent past, it is hard to forecast what will happen in the future. Because the price of diesel has stayed low for the last year and

[195] Westshore Terminal. Westshore Terminals Investment Corporation Annual Report 2015. It can be accessed at sedar.com. Page 3.
[196] We are assuming that the Canadian dollar was worth 80% of the U.S. dollar in 2015. http://www.bankofcanada.ca/rates/exchange/cad-usd-rate-lookup/
[197] Surface Transportation Board. Tongue River Railroad DEIS. Appendix C. Table 4-2. April 2015.
[198] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Table 7.
[199] The dry bulk ships would either be Capesize vessels or Panamax vessels. We are assuming that they would be on the lower end of the Capesize or upper end of the Panamax vessels at 150,000 dry weight tons. http://maritime-connector.com/wiki/capesize/
[200] This assumes a 30 day round trip, 1414 miles each way, two days to unload, average bunker fuel costs of $154.93 per metric tonne, a speed of 13 knots, a capsize vessel that can hold 150,000 tons, a fuel consumption rate of 1 g/ton/mile, and a vessel fee of $5,000 per day.
[201] Dry Bulk Ships. Market Report. http://www.dryships.com/pages/report.php
[202] UNCTAD. Review of Maritime Transport. United Nations Conference on Trade and Development. Figure 3.9. http://unctad.org/en/PublicationsLibrary/rmt2015_en.pdf and Reuters. Weak Demand, vessel surplus to create horror 2016 for commodities shipping. 12.28.2015. http://www.cnbc.com/2015/12/28/weak-demand-vessel-surplus-to-create-horror-2016-for-commodities-shipping.html
[203] Ibid.

because the dry bulk shipping market has also been extremely depressed, these shipping costs estimates are also low. It is quite possible that the oil market will recover and that the dry bulk shipping daily prices will rise out of the current slump that they are in. The daily costs of ship hiring have been as high as eight times as much as they currently are within the last four years.[204] It is important to remember that during this period there was a shortage of Capesize vessels, and coal exports were reaching their peaks. During that same period, a large number of Panamax and Capesize vessels were also being built which has led to the current over supply situation where the dry bulk daily rates are so low that the owners cannot recover their own costs and the market is saturated with empty ships. It is no accident that many of these trends move together. Whether it is investment in coal mines, port facilities, or dry bulk ships, all of the pieces associated with moving large volumes of coal to Asia shifted into high gear right as China moved into the coal import market in a major way but have slid back to a much lower level since China's growing demand for coal has slowed considerably.

Putting all of the pieces together: A mine mouth cost of $10 per ton, a rail shipping cost of $20.14 per ton, a port fee in the PNW of $8.05, and a dry bulk shipping cost of $2.60 per ton results in a delivered price of $47.59 per metric tonne.[205] Although this delivered price may seem unthinkably low compared to those presented in the DEIS and historical prices, it is still not low enough to compete in Asia with Indonesian coal. According to a recent Woods Mackenzie article, which forecasts roughly the same delivered cost, PRB coal's cost is still $12 per ton more than Indonesian coal.[206] Note that if the coal is assumed to be shipped into South Korea there is a fairly substantial import tax[207] that would need to be paid. Since we are assuming that the Indonesian coal of about the same Btu content is the chief competitor for PRB coal, they would both face the same import tax.

In conclusion, we project that PRB coal shipped through the PNW would have more than a $8 per metric tonne *disadvantage* compared to sub-bituminous Indonesian coal. Although this disadvantage is not as high as the Cloud Peak fourth quarter report indicated, we attribute the difference to long term contracts that Cloud Peak signed with shippers which boosted its estimated delivered costs. Our estimated disadvantage is quite close to what was predicted by Woods and MacKenzie in the middle of February 2016 as noted above.

The end result is that the PRB cannot currently price into the Asian import markets. If there were to be some significant positive changes in Asian coal markets, PRB coal could become competitive in the future. The key part to remember when trying to put all of these pieces together is that the mine mouth price of PRB coal is a very small part of the delivered price to the Asian markets. If there was more coal being shipped into Asian markets, then presumably the ship hiring costs as well as the price of fuel for the ships and the rail transportation cost could increase. BNSF can adjust its shipping charges depending on the demand for its services

[204] In September of 2013 the Baltic Dry Index went above $40,000 per day for a very short period. Dry Ships Inc. Daily Market Report. http://www.dryships.com/pages/report.php
[205] Since U.S. coal is sold on a Gross as Received (GAR) basis vs. a Net as Received (NAR) basis we must convert PRB coal to NAR and adjust for the slightly higher Btu content of the Indonesian coal (Btu content of 8814 Btu/lb).
[206] Roberts, A. Planned US coal ports: a swift trip from vital to irrelevant. Blog. 2.10.2016. http://www.woodmac.com/blog/planned-us-coal-ports-a-swift-trip-from-vital-to-irrelevant/
[207] South Korea to increase coal import tax on 1 July. Freight News. 6.25.2015. http://www.hellenicshippingnews.com/south-korea-to-increase-coal-import-tax-on-1-july/

and, the daily price of the dry bulk ships could increase above the level at which they lose money (roughly $8,000 per day). Of course diesel prices could rebound if oil prices move significantly upward. The countries that PRB coal will be competing with in the Pacific Basin, chiefly Australia and Indonesia, have slightly shorter shipping distances to the major Pacific Basin coal importers and will continue to price them into the Asian markets ahead of the PRB unless their coal mining costs rise.

To put this into a context that makes a little more sense and is easier to compare different coal grades, we present the same numbers in dollars per million Btu. The current market suggests that Montana PRB coal could price into Japan for about $2.59 per million Btu and still not be competitive with Indonesian or Australian coal (see figure 1.a below).[208] This stands in stark contrast to the $3.68 that was used in the DEIS.[209] The fact is that the PRB coal, even with the lower current 2016 costs still cannot price into the market.

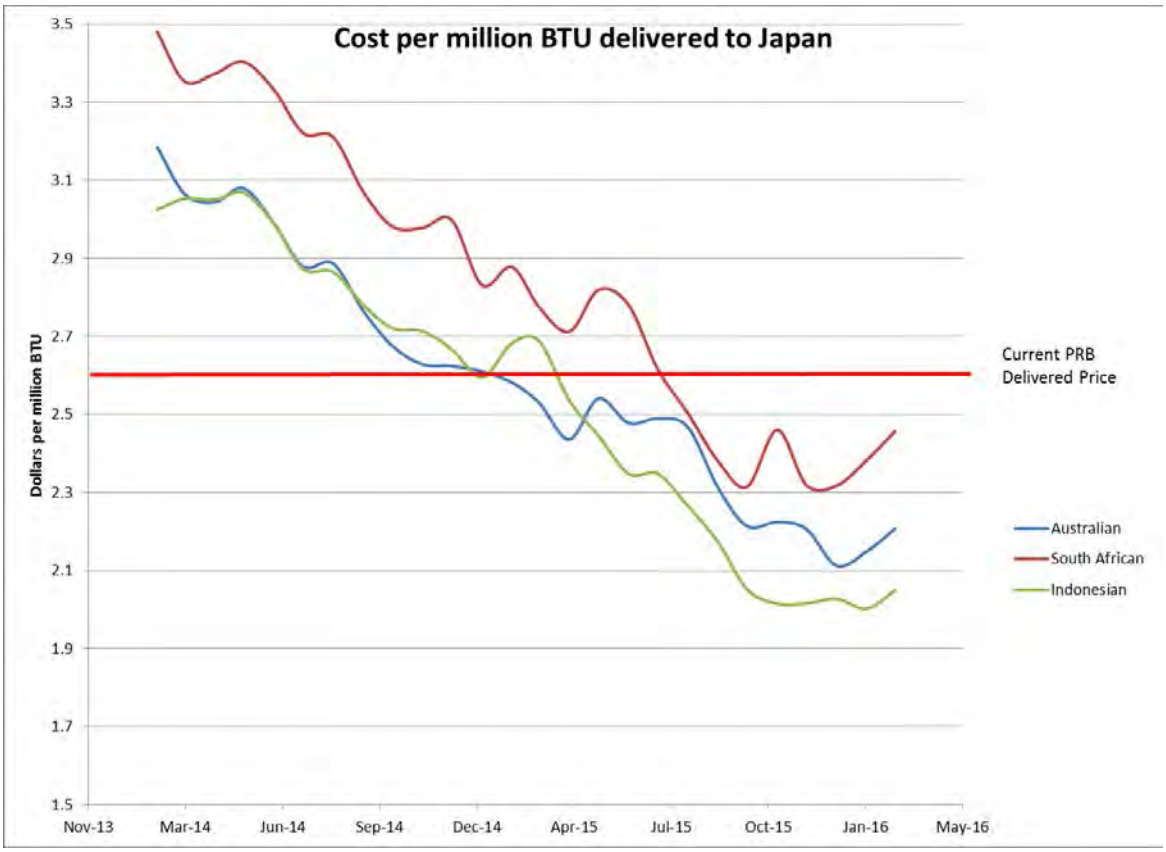
If we turn to look at the different benchmarks that are presented in the DEIS[210] we can get a comparison of where we stand in 2016. The closest substitute for 8800 PRB coal is Indonesian sub-bituminous coal that averaged $37.72 per metric tonne over the last 6 months.[211] If we assume that it is 2,648 nautical miles from Indonesia to Japan[212] and apply the same ship hiring and diesel fuel costs from above[213], then the delivered price in Japan is $39.28 per metric tonne for Indonesian coal. This can be compared to PRB coal at a delivered price of $47.59 for a price disadvantage for PRB coal of $8.31 per metric tonne. So although PRB coal has what would appear to have an essentially unthinkably low delivered price, it still is not close to pricing into Japan when compared to the closest Indonesian coal in terms of Btu. For comparison, the delivered cost per million Btu for the McCloskey index Indonesian sub-bituminous coal is about $2.02.

For a comparison of other delivered coal prices in dollars per million Btu, we present Figure 1.a. below. What is clear from this figure is that the PRB has not been able to price into this market for at least the last year. It is very likely that the PRB has not been able to price into Japan for longer than this[214] since we are assuming that the shipping costs have remained constant across this period when in reality they certainly have not. For this reason, we only present the last couple of years of delivered prices as the further we go back in time assuming the same low shipping costs, the farther our delivered prices into Japan are from a more realistic analysis. Ship hiring costs as well as the cost of diesel (bunker) fuel are at near record lows when

[208] Here we adjust for the gross as received basis for PRB heat content and convert it to a net as received basis. The same was done for our price per metric tonne.
[209] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Table 8.
[210] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Figure 14.
[211] Indonesian Coal (McCloskey sub-bituminous) Futures, Continuous Contract #1. This coal is listed FOB at the port and 8,814 Btu/lb NAR. https://www.quandl.com/data/CHRIS/CME_MCC1-Indonesian-Coal-McCloskey-sub-bituminous-Futures-Continuous-Contract-1-MCC1-Front-Month?utm_medium=graph&utm_source=quandl
[212] Here we are assuming the coal is coming from Kalamantan, Indonesia (Balikpapan) and arriving in Japan (Yokohama). http://www.sea-distances.org/
[213] This adds a cost per metric tonne of $1.56 to ship from Indonesia to Japan.
[214] It is also instructive that the DEIS Past Conditions scenario chose a time frame that is shown on figure 1.a to price in at about the same price as the other index prices.

adjusted to constant dollars. Because coal from the proposed Longview port must travel a longer distance when compared to Australian or Indonesian coal, any increases in shipping costs (ship hiring costs and fuel) disproportionately disadvantage the PRB.

Figure 1.a.



Source: The shipping distances are from http://www.sea-distances.org/, the Indonesian Coal is McCloskey Index sub-bituminous coal (8814 Btu/lb), the Australian coal is from Indexmundi bituminous coal (12000 Btu/lb), the South African Coal is sub-bituminous coal from Indexmundi (10793 Btu/lb), the shipping costs are for current rates assuming a ship hiring cost of $5,000/day and the diesel (bunker fuel) cost are from www.shipandbunker.com 3 month average cost.

We do not have to simply recreate the delivered costs to Asian markets to see that PRB coal delivered to Asia is not currently competitive. The DEIS admits that currently the PRB is not competitive when shipped into its closest Pacific Basin market:

> *"Delivered prices to Japan in the range of $3.0/MMBtu suggest that Powder River Basin coal would have a difficult time being cost-competitive, if shipped through the Pacific Northwest to Japan or other Pacific Basin countries, until international coal prices increase*."[215]

[215] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Page 3-9.

It should be noted that the DEIS was looking at the competitiveness of PRB coal delivered to Japan in 2014/2015 and not 2016. This clearly supports our delivered prices which are also not competitive, as we state above.

Unfortunately for the big coal producers in the PRB, the international market, especially with respect to American coal, has also become very soft.[216] Cloud Peak Energy is now paying to not export its Montana PRB coal through the Westshore port in Vancouver, BC to Asia.[217]

> *"Under the amended agreement, Cloud Peak Energy made an upfront payment to Westshore and will make quarterly payments from 2016 through 2018 in lieu of the previous take-or-pay commitments during this three-year period. If this amendment were in effect as of September 30, 2015, our outstanding undiscounted port take-or-pay commitments at that time would have been approximately $454 million through the remaining term of the agreement if we do not ship any export tons. Except as amended, the original throughput agreement remains in place through the end of 2024."*[218]

Although it appears that Cloud Peak signed what now looks like a very risky agreement with Westshore for the last of their available space to ship coal for a ten year period to Asia, it is very instructive to see that Cloud Peak would rather pay to not ship coal instead of losing even more mining and shipping their coal to Asia. In Cloud Peak's fourth quarter (2015) earnings call transcript, Cloud Peak makes clear that they are currently about $20/ton outside of the delivered price in Asia.[219] [220] Clearly both domestic and international demand for steam coal is flagging.

Appendix B: Changes in Pacific Basin Coal Markets since the 2008-2013 Boom

China

China dominates Asian coal markets. Although the distance to get PRB coal to China is greater than either Japan or South Korea, if China decides to import coal, it dramatically moves the needle on global steam coal prices. In fact, the reason that there is even a port that is being considered at Longview is largely because of China's recent (2009-2014) coal buying behavior. As China emerged as a coal importer, it immediately dominated the market. Because of a series of cascading events including the reorganization of the Chinese coal market, a need to ship their coal from the north and northwest to the energy using southeast, and government controlled energy pricing schemes, China's domestic coal production was temporarily not sufficient to meet domestic coal demand. This void was filled by reduced exports and increased

[216] Park, B. Coal production and prices decline in 2015. Today in Energy. EIA. 1.8.2016. https://www.eia.gov/todayinenergy/detail.cfm?id=24472
[217] Lutey, T. Mine layoffs preceded by cut in coal shipments, reports show. *Missoulian*. 12.31.2015.
[218] Cloud Peak Energy. Announcements. October 28, 2015. http://investor.cloudpeakenergy.com/press-release/announcements/cloud-peak-energy-enters-amendment-throughput-agreement-westshore-termin
[219] Cloud Peak Energy's (CLD) CEO Collin Marshall on Q4 2015 Results- Earnings Call Transcript. *Seeking Alpha*. 2.17.2016. http://seekingalpha.com/article/3904926-cloud-peak-energys-cld-ceo-collin-marshall-q4-2015-results-earnings-call-transcript?part=single
[220] It should be noted that this $20/ton is a long term rail and port contract (BNSF and Westshore) that we do not have access to. Although the current metrics do not work out to this large of a disadvantage, this was the price the Cloud Peak agreed to so that they could secure space on the rail and at the port.

imports that suddenly caused a massive spike in the world benchmark coal price indexes.[221] This spike in benchmark coal price indexes immediately caused large spikes in the hiring costs in the dry bulk shipping market as well as a ship building frenzy.

Just as quickly as China jumped into the import game, it jumped right back out in 2014 causing global coal price indexes to crash.[222] In the wake of China's initial reduction in coal exports and large increases in coal imports, coal port proposals up and down the U.S. west coast materialized. At the same time, U.S. coal consumption was flagging. This was in part because of low natural gas prices and concerns over the impact of the GHG and other toxic emissions associated with coal fired generation. This led American coal producers to look even more eagerly at potential Chinese and other Asian coal markets to make up for falling coal demand in the U.S. With China's second about face, reducing imports, the U.S. coal industry was left trying to pencil out the possible gains and losses of new coal mine and port proposals. China has become a dominant player in the world coal market. If and when it throws its large hat into the import game once again, it is likely to trigger high coal prices in the international market. It is important to realize that U.S. coal does not have to get shipped to China for China to dramatically change the benchmark prices of coal. If China buys, as they did in the 2009-2014 period, large volumes of coal from Indonesia and Australia and drives up the price of that coal, then Japan, South Korea, and Taiwan, nations that are almost completely dependent on imports for their coal supply, will suddenly be left facing high coal costs and could turn to the west coast of the U.S. for lower cost sources of supply. The point is that China does not have to buy PRB coal shipped out of the west coast of the U.S. for the PRB producers to reap the benefits of China importing coal.

This can be seen in the modeling that was done by the DEIS. In their modeling, the coal from the U.S. generally gets sent to Japan. This is rational since Japan is the closest Asian steam coal consumer to the proposed Longview port. The result is a cascading effect where Japan does not increase its consumption of coal, but it does change the price of steam coal exported to the Asian market. In the Upper Bound scenario, the only scenario where U.S. coal economically prices into the Asian markets, Japan and South Korea receive all 44 million tons of coal from the proposed port (except in 2040 where China receives 10.5 million tons of coal from the proposed port).[223] The end result is that thermal coal prices drop in Asia and 19.3 million tons of coal per year are "induced."[224] In other words the impact of the port is that Asia burns 19.3 million more tons of coal than it otherwise would have.

China uses massive volumes of coal to produce electricity. In 2014, China produced 3.75 billion metric tonnes of coal with 3.18 billion metric tonnes being steam coal.[225] The next largest

[221] Oster, S. China Spurs Coal-Price Surge: Once-Huge Exporter Now Drains Supply, Repeat of Oil's Rise?. The Wall Street Journal. 2.12.2008. http://www.wsj.com/articles/SB120275985736359763
[222] Although China did not quit importing coal they are no longer projected to import ever increasing volumes of coal. EIA. China and India drive recent changes in world coal trade. Today in Energy. 11.20.2015. https://www.eia.gov/todayinenergy/detail.cfm?id=23852
[223] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Table 65. Page 6-42.
[224] ICF. Millenium Bulk Terminals-Longview SEPA Environmental Impact Statement. SEPA Coal Market Assessment Technical Report. Table 62. Page 6-40.
[225] World Coal Association. Coal Facts 2015. https://www.worldcoal.org/sites/default/files/Coal%20Facts%202015.pdf

producer of steam coal is the U.S. who produced 0.916 billion metric tonnes of coal in 2014.[226] China is committed to lowering their coal consumption and lowered their total consumption 3.7 percent in 2015 compared to 2014 levels and 2.9 percent in 2014 compared to 2013.[227] This is significant because at the peak of China's importation of coal (in 2013), China was importing 0.252 billion metric tonnes of coal.[228] In 2013, China produced 3.28 billion metric tonnes of coal.[229] In other words, they imported about 7 percent of the steam coal that they used for electrical generation. By cutting their coal consumption in 2014 and 2015 they *could* have already made imports unnecessary. Of course they did not stop importing coal in 2015 and in fact, they imported just over 0.20 million metric tonnes of steam coal.[230] The key with China is that they are actively and effectively cutting their steam coal consumption and are no longer looking to rely heavily on the international steam coal market.

Because of China's coal sector reorganization, a decrease in the bottlenecks that have plagued China's domestic coal movement, and a move by the government toward more low carbon energy, China is trying to cut its exposure to the volatile global coal market.[231] Although coal produced more than 60 percent of the energy in China in 2013, the government has been actively working to add renewables and other non-coal fired generation while imposing a tariff (3-6 percent) in 2015 on coal imports.[232]

China is the world's largest electric power generator and coal consumer. In 2013, 63 percent of China's installed capacity was coal fired, 22 percent was hydropower, 6 percent was wind, natural gas represented 4 percent, and nuclear made up just 1 percent.[233] This puts China in a slightly different boat than the other large coal importers in Asia. China cannot have large fuel substitution between natural gas and coal fired generation on the scale that a Japan or a South Korea can (as a percentage of total generation). This does not mean that a change in the price of coal will not have an impact on the price or consumption of electricity. In fact China is actively working, as part of their Thirteenth 5-year plan, to add significantly more natural gas fired electrical generation.[234] As we stated above, natural gas constituted just 4% of China's electrical generation in 2013 and the Thirteenth 5-year plan has 10% of their electricity coming from natural gas by 2020. As China tries to decouple their electricity and emissions growth from their economic growth they will have to rely increasingly more heavily on natural gas and renewables for electrical generation if they are going to be able to meet their GHG reduction targets.

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[226] Ibid.
[227] The Guardian. China coal consumption drops again. *The Guardian.* 2.29.2016. http://www.theguardian.com/environment/2016/feb/29/china-coal-consumption-drops-again
[228] IEA Statistics. Key Coal Trends Excerpt from: Coal Information 2015. Table II.11. 2015. http://www.iea.org/publications/freepublications/publication/KeyCoalTrends.pdf
[229] Ibid.
[230] Reuters. Update 1-China 2015 coal imports plunge 30 pct on demand slump. *Reuters*. 1.12.2016. http://www.reuters.com/article/china-economy-trade-coal-idUSL3N14X1TC20160113
[231] EIA. China: International energy data and analysis. 5.14.2015.
[232] EIA. China: International energy data and analysis. 5.14.2015.
[233] Ibid.
[234] EIA. China. International Analysis. 5.14.2015 https://www.eia.gov/beta/international/analysis.cfm?iso=CHN Since this article was written the 13th 5 year plan has set even more ambitious goals for China calling for a 13% rise in natural gas consumption in 2016 and a target of 10% by 2020. http://www.forbes.com/sites/judeclemente/2016/04/24/chinas-rising-natural-gas-demand-pipelines-and-lng/#2830851d6a38

Japan:

Japan has taken a lot of heat recently about its climate goals, receiving criticism for their lack of participation in the Paris climate talks[235] and their dependence on fossil fuels in the wake of the Fukashima nuclear disaster. Japan is currently forced to rely much more on coal and natural gas (LNG) then they would like. Following Fukishima in 2011, Japan shut down all of its nuclear power plants and since then has only brought two of them back on line in late 2015.[236] Because they have not been able to count on the same nuclear power that they once had and because of the political climate surrounding Japan's nuclear facilities, Japan has rethought their reliance on nuclear power. While not getting rid of nuclear power as they look to the future, they have scaled back the amount of nuclear power that they will use going forward.

"*The government wants to make nuclear energy account for 20 to 22% of Japan's electricity mix, versus 30% before Fukushima, with renewable energy making up 22-24%, liquefied natural gas for 27% and coal 26%.*"[237]

While there is some political controversy over the datum to be used for the baseline, Japan is committed to cutting their overall GHG emissions. The start date of 2013 that much of the world would like to use does not sit well with the Japanese. After Fukishima in 2011, Japan's GHG emissions increased until their levels in 2013 were their second highest on record.[238] Japan would greatly prefer to see the datum start at 2005 when 30 percent of their electricity came from nuclear power and not 2013 when none of their electrical power came from nuclear.

Whenever the baseline is set, Japan will have a hard time meeting its climate goals. Japan is currently planning on building 41 new coal fired power plants[239] while many nations, like the U.S., are shifting electric generation to heavier reliance on natural-gas-fueled and renewable generation. Japan, like South Korea, has a much heavier import tax on natural gas than coal which strengthens their reliance on coal. Japan (as of 2014) was the world's largest LNG importer, second largest coal importer, and third largest importer of crude oil and oil products.[240] Japan, because of its lack of domestic fossil fuels, imports nearly all of its fossil fuels. As of 2013, natural gas was 43 percent of Japans electrical generation, oil was 14 percent, and coal made up 30 percent. As Japan restarts its nuclear generators there fossil fuel electrical generation will decline, but clearly Japan will not stop burning coal and natural gas any time soon. What is important to point out here is that Japan does have large amounts of natural gas fired electrical capacity and so the relative cost of coal compared to natural gas in Japan is very important. If they receive low cost U.S. coal from the proposed port (or anywhere else), Japan has the ability to rely more heavily on natural gas than coal which has significant GHG savings.

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[235] Yamamoto, D. Japan a virtual nonentity at Paris climate talks. *Japan Times*. 12.16.2015. http://www.japantimes.co.jp/news/2015/12/16/national/japan-virtual-nonentity-paris-climate-talks/#.VvrutPkrKhc
[236] World Nuclear. Nuclear Power in Japan. Country Profiles. March 2016. http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx
[237] Reuters. Japan outlines 2030 carbon target ahead of Paris climate summit. *The Guardian*. 4.30.2015. http://www.theguardian.com/environment/2015/apr/30/japan-outlines-2030-carbon-target-ahead-of-paris-climate-summit
[238] Reuters. Japan sets 26 percent cut in greenhouse gas emissions as target. Reuters. 7.17.2015. http://www.reuters.com/article/us-japan-carbon-idUSKCN0PR0A220150717
[239] Reuters. Japan, South Korea stick to coal despite global climate deal. Reuters. 12.15.2015. http://www.reuters.com/article/us-climatechange-summit-coal-idUSKBN0TY2TG20151216
[240] EIA. Japan: International energy data and analysis. 1.30.2015.

Because Japan is relatively close to the PRB and because in the DEIS Japan is projected to receive much of the coal exported through the Longview port, understanding Japan's appetite for coal in the future is critical. Although they will likely not import dramatically more coal than they have in the past, they will likely continue to be a key player in the international coal market. Although there is intense international pressure for them to curb their GHG emissions, there is even stronger internal pressure not to be so reliant on nuclear power in the wake of the Fukashima nuclear disaster.

South Korea:

South Korea, like Japan, is heavily reliant on coal and natural gas (LNG) imports. South Korea relies on imports to meet 97 percent of their primary energy consumption.[241] Like Japan, they simply do not have the natural resource base to supply themselves with the materials they need to fuel their energy infrastructure. As the world's ninth largest energy consumer in 2014, South Korea is one of the top energy importers in the world.[242]

Coal makes up 31 percent of South Korea's primary energy consumption, petroleum and other liquids make up 39 percent, natural gas makes up 16 percent, and nuclear makes up 13 percent, with renewables making up about 1 percent.[243] South Korea imported 144 million metric tonnes of coal in 2014 and was the world's fourth largest importer after China, India, and Japan. This is of special significance for PRB producers and the possibility of a PNW coal port since South Korea is a proven consumer of PRB coal and only marginally farther from the PNW than Japan. In fact, this is where Cloud Peak was sending their coal until the global price of coal crashed and Cloud Peak suspended their shipments through Westshore Port in British Colombia.[244]

South Korea and Japan were roundly criticized during the Paris Climate Talks for not doing enough to curb their GHG emissions.[245] South Korea plans to build 20 more coal fired power plants by 2021. Although South Korea recently raised the tax that they have on coal imports, the tax that is applied to natural gas imports is still three times that of coal. South Korea currently runs their coal fired generators at 80 percent of capacity compared to their gas fired generators that run between 35 and 40 percent of capacity.[246] If the delivered price of coal relative to gas was to change this could open the potential for fuel substitution that could have dramatic GHG implications. The same is likely true of Japan. Since natural gas has about half of the emissions associated with electrical generation when compared to coal[247] (on an energy basis) the relative price of the two fuels and the climate goals of the different countries are important factors in determining the fuel mix of electrical generation.

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[241] EIA. Korea, South: International energy data and analysis. 10.5.2015.
[242] South Korea ranks in the top five energy importers in the world for LNG, coal, crude oil, and refined products. Ibid.
[243] Ibid.
[244] Cloud Peak Energy. 2014 Annual Corporate Report. Page 2. 2015. https://cloudpeakenergy.com/wp-content/uploads/2015/05/2014-annual-corporate-report.pdf
[245] Routers. Japan, S Korea stick to coal despite global climate deal. Reuters. 12.16.2015. http://news.trust.org//item/20151216031302-52e4s/?source=search
[246] Ibid.
[247] EIA. FAQ. How much carbon dioxide is produced when different fuels are burned? https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11

While much of the world has been focused on the GHG emissions in Asia from China and India, South Korea and Japan have been able to remain relatively quiet while investing in new coal fired generation. This puts South Korea on a track to using coal long into the future and South Korea has already been buying coal from the PRB (Cloud Peak). Because South Korea is planning to invest more money into new coal fired generators and because South Korea essentially imports all of their own coal, South Korea is one of the keys to understanding the potential for coal export from the U.S. west coast. Although South Korea is less reluctant to invest in nuclear generation going forward than Japan, their current reliance on coal and their lack of nuclear facilities means that they will also be heavily reliant on coal and natural gas imports long into the future.

Taiwan:

Like Japan and South Korea, Taiwan imports nearly all of their fossil fuels (98 percent).[248] Forty seven percent of the electricity that is generated is from coal, natural gas makes up 29 percent, and nuclear power makes up 16 percent. Taiwan consumed about 75 million tons of coal in 2013, all of which was imported. Over the period of 1992-2012 the imports of LNG for electrical generation grew eight fold.[249] Although Taiwan currently gets 16 percent of their power from nuclear power plants, the Democratic Progressive Party, that was elected in 2016, has a policy in place to phase out nuclear power by 2025. Whether or not this will be possible is open to debate, but Taiwan has completed/constructed two new nuclear facilities that are currently mothballed as levels of public fear greatly increased after the Japanese Fukishima accident.

Taiwan, although not a member of the United Nations, set forth some fairly progressive GHG emissions goals for 2030. Unlike Japan and South Korea who did have a seat at the table for the Paris Climate Talks and sat quietly, Taiwan pledged, and passed legislation, to curb its GHGs by 50 percent by 2030 under the business as usual scenario.[250] Taiwan is a low lying island that is hit with an average of four typhoons a year.[251] Because of the heavy rainfall associated with the typhoons and the idea that they are getting worse as climate change exacerbates extreme weather patterns, Taiwan has pledged fairly dramatic GHG emissions reductions.

Whether or not Taiwan will be able to meet its climate goals is still an open question. Like Japan and South Korea, a movement away from nuclear power requires substantial investment in low carbon sources for electricity if they are going to meet their climate goals. The new president of Taiwan, Ing-wen Tsai, has pledged 30 billion dollars (U.S.) will be invested in the renewable sector.[252] Taiwan is the second leading producer of solar panels in the world behind China, but

[248] EIA. Taiwan: International energy data and analysis. September 2015.
[249] World-Nuclear.org. Nuclear Power in Taiwan. Country Profiles. http://www.world-nuclear.org/information-library/country-profiles/others/nuclear-power-in-taiwan.aspx
[250] Winglee, M. No Seat at the Table: Taiwan and the Global Fight Against Climate Change. *The Diplomat*. 12.2.2015. http://thediplomat.com/2015/12/no-seat-at-the-table-taiwan-and-the-global-fight-against-climate-change/
[251] Ibid.
[252] Darby, M. Taiwan election points to nuclear phase0out by 2023. Climate Home. 1.14.2016. http://www.climatechangenews.com/2016/01/14/taiwan-election-points-to-nuclear-free-future/

analysts fear that the Taiwanese people will not accept the hike in energy rates associated with this investment and implementation of renewable sources.[253]

Taiwan, like Japan and South Korea, gets all of its fossil fuels for electrical generation from imports. Because Taiwan has such a large percentage of its electricity that comes from coal and natural gas and because they are planning to phase out nuclear power, there is a strong possibility that their energy mix could be affected by the price of coal relative to natural gas. If either fuel source was to change price dramatically, fuel substitution is a possibility. Although Taiwan does not import the same volumes of coal or natural gas as a Japan or South Korea they also will be heavily reliant on coal and natural gas well into the future.

[253] Ibid.

From: Butorac, Diane (ECY) <dbut461@ECY.WA.GOV>
Sent: Monday, June 06, 2016 4:29 PM
To: Pace, Erin
Subject: RE: Comment for MBTL DEIS

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Orange Category

From: North, Teri (ECY)
Sent: Tuesday, May 31, 2016 4:22 PM
To: Toteff, Sally (ECY) <STOT461@ECY.WA.GOV>; Butorac, Diane (ECY) <dbut461@ECY.WA.GOV>
Subject: FW: Stop the largest coal export terminal in the nation

FYI – Maia got the same email.

From: Cathy Lehman [mailto:info@environmentalpriorities.org]
Sent: Tuesday, May 31, 2016 4:11 PM
To: North, Teri (ECY) <teno461@ECY.WA.GOV>
Subject: Stop the largest coal export terminal in the nation

Environmental Priorities Coalition

A network of over 20 leading environmental groups in Washington that influence policy at the state level.

Teri,

Our Environmental Priorities alerts usually focus on action in the state legislature. However, once in a while we reach out on critical environmental issues outside of the legislature, where your voice will make a difference.

Right now you have the chance to speak out against the last coal export proposal in Washington. If built it would be the largest coal export terminal in the nation.

The public comment period on the Draft Environmental Impact Statement for the massive Millennium coal export terminal proposed in Longview, Washington has arrived.

Make your voice heard today. Say NO to the largest coal export terminal in the U.S.

This project would spread toxic coal dust in dozens of Northwest communities, clog our

railroads and ports, risk our families' health, pollute our air and water, and stoke the climate crisis.

Coal's future is bleak – one of Millennium's backers, Arch Coal, filed for bankruptcy in January and handed off the rest of their stake in the proposal just last week. But Big Coal still wants to have a dirty coal chute abroad as their last hope to prop up an unhealthy industry. Fortunately, the movement to stop dirty coal from polluting our towns and rivers is bigger and stronger than ever.

Now is our time to raise our voices and lock out dirty coal once and for all, so we can focus on the transition to a clean energy economy.

Please stand up to Big Coal today!

Thanks for all you do,

Cathy Lehman
Environmental Priorities Coalition

P.S. Already taken action or want to do more? Forward this email to a friend or family member so they can speak out against coal exports in the Northwest too!

This alert is part of a series of action alerts from the Environmental Priorities Coalition, a network of leading environmental groups in Washington state. Formed in 2003, the Environmental Priorities Coalition selects priority issues each legislative session that make Washington State a better place to live.

American Rivers | Audubon Washington | Climate Solutions | Conservation Northwest | Defenders of Wildlife | Earth Ministry | Environment Washington | Fuse | Heart of America Northwest | The Lands Council | League of Women Voters of Washington | NW Energy Coalition | Sierra Club Cascade Chapter | Sound Action | Surfrider Foundation | Washington Conservation Voters | Washington Environmental Council | Washington Toxics Coalition | Washington Wildlife and Recreation Coalition | Zero Waste Washington

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June 12, 2016

Cowlitz County
Washington Department of Ecology &
U.S. Army Corps of Engineers
c/o ICF International
Via email at https://public.commentworks.com/cwx/mbtldeiscommentform/

Re: Public Comment on Millennium Bulk Terminals - Longview, LLC Project SEPA/NEPA Environmental Impact Statements, SEPA Draft Environmental Impact Statement

Dear Agency Representatives:

Thank you for this opportunity to provide public comment on the Draft Environmental Impact Statement (DEIS) for the proposed Millennium Bulk Terminals - Longview, LLC project (MBTL or the project). Please accept the following comment on the DEIS from Friends of Alaska National Wildlife Refuges (Friends), FRIENDS of the San Juans (FRIENDS), and Friends of Grays Harbor (FOGH).

We recommend selection of the No Action Alternative. Although the DEIS suffers from omissions and other deficiencies discussed below, the document also confirms that there would be significant and unavoidable environmental impacts from the MBTL that cannot be adequately mitigated. A revised DEIS and Final EIS for the project, based on additional studies and analysis, must correct deficiencies in the DEIS that we have identified below. Correction of these deficiencies is necessary to fully apprise decision makers of the environmental consequences of their decision, disclose factual information on impacts to the public, and lend greater support for the conclusion that the MBTL presents significant unavoidable adverse impacts that cannot be adequately mitigated.

Friends of Alaska National Wildlife Refuges (Friends) is an independent, non-profit organization dedicated to promoting the conservation of the natural resources of all the Alaska National Wildlife Refuges. The Friends promote understanding and appreciation of these refuges and assist the U.S. Fish and Wildlife Service in meeting its mandates. Our work includes educating the public and decision makers on local, national, and international levels about Alaska's National Wildlife Refuges; assisting refuges in accomplishing their missions through wildlife management and habitat

improvement projects and funding refuge oriented projects through grants, memberships, donations, and other activities.

FRIENDS of the San Juans (FRIENDS) is an independent, non-profit organization that advocates for healthy, sustainable communities and has defended natural spaces and wildlife in the San Juan Islands for over 35 years. Our scientists, educators and lawyers provide the expertise that citizens and groups need to protect and preserve the Salish Sea ecosystem. FRIENDS is concerned about the marine impacts associated with the MBTL project – many of the concerns are echoed along the entire shipping route and must be included in the EIS process.

Friends of Grays Harbor (FOGH) is a broad-based 100% volunteer tax-exempt 501(c)(3) citizens group made up of crabbers, fishers, oyster growers, and caring citizens. The mission of FOGH is to foster and promote the economic, biological, and social uniqueness of Washington's estuaries and ocean coastal environments. The goal of FOGH is to protect the natural environment, human health, and safety in Grays Harbor and vicinity through science, advocacy, law, activism, and empowerment. We oppose locating any coal or other fossil fuel terminals in the State of Washington, and any expansion of such terminals elsewhere.

I. INTRODUCTION

The Friends, FRIENDS, and FOGH are deeply concerned about the significant adverse environmental impacts of the proposed project. The scoping comment timely submitted by the Friends, FRIENDS, and FOGH discussed the interconnectedness of significant adverse impacts of the proposed project on the environments, resources, and economies of Washington and Alaska's National Wildlife Refuges. These Refuges are inextricably linked by law (the National Wildlife Refuge System Administration Act of 1966 and National Wildlife Improvement Act of 1997, 16 U.S.C. §§ 668dd -668ee). The biological integrity, fish and wildlife diversity, and environmental health of the Alaska and Washington's Refuges are also interdependent. Among other things, the refuges and marine waters offshore from them support shared migratory species. These shared species include juvenile Pacific salmon – including Chinook salmon –that migrate from their natal streams in Washington State to waters off the Alaska Maritime National Wildlife Refuge and numerous shorebird species that nest in Alaska's National Wildlife Refuges and winter or stopover in Washington State's Refuges. Congress recognized that refuges in the National Wildlife Refuge system serve "a pivotal role in the conservation of migratory birds, anadromous and interjurisdictional fish, marine mammals, endangered and threatened species, and the habitats on which these species depend." Findings §2, National Wildlife Improvement Act of 1997, Pub.L.105-57, 105th Congress.

Although the DEIS contains discussion of significant and unavoidable impacts that support our recommendation of a No Action Alternative, the DEIS fails to include studies, analysis, and full disclosure of significant adverse impacts the project would have on the resources dependent upon and protected by Washington and Alaska's National Wildlife Refuges. The following provisions of SEPA and the rules implementing it are especially relevant to assessing impacts upon these refuges and their fish and wildlife resources: SEPA's purpose statement, RCW 43.21C.010 ("prevent or eliminate damage to the environment and biosphere,"… "enrich the understanding of the ecological systems and natural resources "important to the state and nation"); SEPA's Guidelines for State Agencies and Local Governments, RCW 43.21C.030(f) ("[r]ecognize the worldwide and long-range character of environmental problems… "); and WAC 197-11-060(4)(b) (consideration of a proposal's impacts shall not be limited to "only those aspects within [lead agencies'] jurisdiction"). Even if the agencies conclude that some the project's impacts on Washington and Alaska's coastal oceans, coastlines and National Wildlife Refuges would have a low chance of occurring, these impacts must be included in the EIS if the resulting environmental consequences would be severe. WAC 197-11-794(2). ("An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred.") As one example, the risk of a vessel accident involving a spill of vessel bunker fuel in any particular location may be low but its occurrence could cause severe, even permanent, harm to marine and bird species.

The fish and wildlife species and their habitats protected by Washington and Alaska's National Wildlife Refuges are held in the public trust for the benefit of future generations pursuant to the laws establishing the various refuges. These refuges must be safeguarded as part of the network of related lands, waters, fish, and wildlife for the benefit of present and future generations of Americans. Additionally, the common law Public Trust Doctrine is applicable here. Fish and wildlife have long been recognized as protected elements of the Public Trust Doctrine in our country's jurisprudence. William Blackstone, II Commentaries on the Laws of England ch. 1, 222 (1769) (Blackstone confirmed that within the English legal system that certain elements remain in common ownership, unsusceptible to full privatization: "[S]uch are the elements of light, *air and water . . . also animals ferae naturae*, or of untamable nature . . . "). The agencies must fulfill their special fiduciary duties as trustees of these resources by studying, analyzing, and disclosing the impacts of this project on the refuges and by fully protecting refuge land, shorelines, and tidelines; the air (including the atmosphere) and water quality that sustain them; the species and habitat dependent upon the refuges for survival; and the communities that derive economic benefit from them. In the context of this permitting matter, the applicable common law Public Trust Doctrine means the agencies must not draw artificially constricted geographic boundaries for study areas, use models based on speculation to minimize actual impacts, employ statuary provisions that contain

minimum standards, or accept less than full mitigation of impacts. As currently written, the DEIS's omission of significant impacts and inclusion of ineffective mitigations runs counter to the public trust in the refuges' natural resources. The DEIS must be revised and the revised DEIS as well as the Final EIS must include studies, analysis, and full disclosure of impacts on Alaska and Washington's National Wildlife Refuges, their protected fish and wildlife species; their habitats including land, air, atmosphere, and water; and communities dependent on the health of the refuges. These resources must be fully protected by the agencies.

II. SIGNIFICANT AND UNAVOIDABLE GREENHOUSE GAS EMISSIOINS, TOXIC MERCURY EMISSIONS, INCREASING CLIMATE CHANGE, AND OCEAN ACIDIFICATION

Global climate change and ocean acidification resulting from the project's greenhouse gas (GHG) emissions and toxic mercury emissions were raised in scoping comments by the Friends, FRIENDS and FOGH as a critically important issues. The climate change and ocean acidification impacts on our two states from extracting, transporting, and burning coal are severe, unavoidable, and indisputable. Terrestrial, marine, and freshwater ecosystems and the human communities that rely on them are all deeply affected by climate change. Scientists have confirmed that global warming is accelerating and impacts on fish and wildlife will likewise be more severe than previously thought. Smith S.J., J Edmonds et al. March 2015. Near-term acceleration in the rate of temperature change. Nature Climate Change 5, 333–336. Available at http://www.nature.com/nclimate/journal/v5/n4/full/nclimate2552.html. Rising sea levels threaten shorelines and refuge species including migrating shorebirds. A warming Arctic is already resulting in phenological asychronies between interacting species protected by the refuges that threatens their survival. For example, van Gils, J.A., S .Lisovski et al. May, 2016. Body shrinkage due to Arctic warming reduces red knot fitness in tropical wintering range. Science, Vol. 352, Issue 6287, pp. 819-821. Available at http://science.sciencemag.org/content/352/6287/819. Increasing numbers and intensities of wildfires associated with a warmer and drier climate and drought conditions are destroying wildlife and their habitat in Alaska and Washington. Warmer oceans threaten fish (including Pacific salmon species and marine mammals that thrive on salmon including Washington State's iconic Southern Resident Orca whales) and fisheries. Species' extinction rates are expected to increase and even accelerate. Urban, M. C. May 2015. Report: Accelerating extinction risk from climate change. Science, Vol. 348, Issue 6234, pp. 571-573. Available at: http://science.sciencemag.org/content/348/6234/571.full.

Ocean acidification is also a grave consequence of increasing anthropogenic CO2 in the atmosphere. Marine waters in Washington and Alaska are becoming more

acidic undermining marine biodiversity and commercial fishing enterprises by hampering the ability of calcareous invertebrates such as shellfish, oysters, and prey species to build shells. Mercury, a potent neurotoxin, released into the air from coal fired power plants in Asia travels across the Pacific to Alaska and Washington States by the atmosphere and oceans. Mercury converts to methylmercury in aquatic environments and enters the marine food web and the food chain.

A. Greenhouse Gas and Mercury Emissions

The project, if permitted, would transport 44 million metric tons of coal per year to Asia. Burning this coal would produce over 90 million metric tons (MMT) of CO2e annually upon full operation of the project, DEIS 5.8-22, and the project would induce more demand for coal in Asia, DEIS 5.8-6. The DEIS recognizes that there would be significant and unavoidable adverse environmental impacts from emissions of greenhouse gases (GHG) if the terminal is permitted, DEIS 5.8-22, and on this basis the No Action Alternative must be selected.

The DEIS analysis for emissions of CO2e is based on the expected transportation routes and emissions from the combustion of coal in Asia. The DEIS properly includes these activities in its GHG emissions determination. The DEIS demonstrates that GHG emissions from rail and vessel transportation of 44 MMT of coal alone would make this project one of the largest GHG emitters in Washington State. DEIS 5.8-14. The DEIS analysis is deficient, however, in that the GHG emissions analysis fails to capture the full life cycle of GHG impacts by omitting emissions from the extraction of coal. The DEIS says that analysis of coal extraction is part of NEPA analysis for coal mines. Since with a few exceptions, a federal emission analysis for mines does not include emissions from transportation (SEPA Greenhouse Gas Emissions Technical Report[GHG Technical Report], 4.2, Table 60) or analysis of coal combustion, and the MBTL DEIS does not include extraction, there is no disclosure and analysis of the total GHG emissions in the DEIS. The DEIS approach is contrary to letters written by the Department of Ecology to the Bureau of Land Management in 2011 concerning the need for a supplemental EIS for the Wright Area Coal Lease application and to the US Department of Transportation in 2013 concerning the Tongue River Railroad. See also, Secretary of the Interior. January 15, 2016. Order No. 3338. Discretionary Programmatic Environmental Impact Statement to Modernize the Federal Coal Program. A revised DEIS and the Final EIS must include studies, analysis, and disclosure emissions from extraction of the coal in its calculation of GHG.

While it may be understandable for the DEIS to assess how markets would react to cheaper coal exported from this project, the method of this assessment and its underlying assumptions must be credible and comprehensible and must not understate or minimize the project's actual contribution to GHG emissions. As written, the DEIS

significantly minimizes likely GHG emissions impacts by applying apparently inconsistent premises and using complex models based on speculation about future coal markets and energy policy conditions. The GHG analysis includes an unwarranted hypothesis that the coal exported by MBTL *could* displace the burning of other types of coal. DEIS 5.8-6. This is inconsistent with the determination that the MBTL *would* induce greater demand for coal in Asia. DEIS 5.8-6. The complex econometric projections and multi-dimensional models used in the DEIS yield four widely varying scenarios. The explanation and application of these models in the DEIS and GHG Technical Report is presented as a "black box" analysis that resists full comprehension.

Using the "preferred 2015 Energy Policy scenario" (which assumes timely effective implementation and continuation of international agreements and federal and state energy policies – assumptions that may or may not prove reliable), the DEIS ratchets down the annual emissions of CO2e upon full operation of the MBTL project from 90 MMT annually to an estimated net annual emissions of 3.2 MMT in 2028 (DEIS Table 5.8-8). Thus, the preferred "specialized computer model" dispels nearly 87% of actual annual emissions upon full operation in 2028. And it ratchets down annual net emissions for full operations over a 10-year period (2028-2038) from 900 MMT to 27.855 MMT. (DEIS Table 5.8-.9). Thus, the "specialized computer model" also dispels over 99% of actual emissions over the 10-year period. Then, putting the emissions in "context" the DEIS concludes that the "average annual net missions from the Proposed Action at full operation would be approximately 2.8% (i.e., 2.5 MMT of CO2e annually) of the downstream combustion emissions from the coal that passes through the coal export terminal." DEIS 5.8-22. This dismisses over 99% of the likely annual emissions at full operation. These results do not make common sense given the fact that the project would produce 90 MMT of CO2e annually upon full operation. While generation of conflicting market analyses and speculation about future GHG emissions policies may characterize, describe, and depict a scenario for GHG emissions from this project, minimizing the picture of these emissions does nothing to prevent or mitigate the *actual* emissions. The EIS must present a realistic and credible GHG emissions analysis starting with the fact that at full buildout the project would transport 44 MMT of coal annually burned in Asia to produce over 90 MMT of CO2e annually.

The DEIS requires applicant to submit a plan to the Washington Department of Ecology to reduce GHG emissions "inside or outside of Washington State" by 50% using measures that are "real, permanent, enforceable, verifiable and additional." The DEIS calls for a 50% reduction of the computer model's attenuated level of emissions. Thus this plan, that would only require the reduction of 693,723 metric tons of GHG emissions (50% of 1,387,446 MMT) from 2021 to 2027 and 1.27 MMT (50% of 2.53) of GHG emissions each year 2028-2038, would not effectively reduce the project's actual GHG emissions. Additionally, the required GHG emissions reduction plan must cover

the entire period of the life of the project. The plan covers 17 years, yet the DEIS says "the terminal would be designed for a *minimum* 30-year period of operation." DEIS S-6. The plan must also be based on the CO2e emissions that would actually be produced by the project annually, i.e. 90 MMT at full build out, rather than only a small fraction of that amount.

The models, underlying facts, assumptions, and outcomes should be re-examined carefully and a revised DEIS and Final EIS must add in GHG emissions from coal extraction to ensure all GHG emissions impacts are considered and to make certain that econometric projections will not discount the project's actual emissions to the detriment of the earth's atmosphere. Despite its flaws, the DEIS acknowledges that even if the mitigation measures identified would substantially reduce GHG emissions, they would not eliminate them : "[t]he Proposed Action's remaining projected contribution to greenhouse gas emissions impacts, which are cumulative in nature, *would still be significant and adverse* under the greenhouse gas emissions intensity considerations previously noted ." DEIS 5.8-22, 5.8-16. Emphasis added. On this basis and particularly in light of the applicable Public Trust Doctrine, the No Action Alternative must be selected.

Applying the same econometric models and "black box" analysis used for GHG emissions to mercury and sulfur dioxide emissions (Appendix I, Sulfur Dioxide and Mercury Emissions, Impact Analysis) the DEIS inappropriately finds that no unavoidable and significant environmental impact would result from the project. This analysis must be reworked in a revised DEIS and in the Final DEIS to inform the public and decision makers of the actual mercury deposition that would occur from the combustion of coal as a result project.

B. <u>Climate Change and Ocean Acidification</u>

In the GHG analysis portion of the DEIS, the DEIS acknowledges that "[t]he climate change impacts resulting from this increase to greenhouse gases would persist for a long period of time, beyond the analysis period and are considered permanent … ." DEIS 5.8-16. The DEIS observes that climate change can result in higher global temperatures, sea level rise, changes in precipitation and snowpack patterns, ocean acidification, wildfire seasons, fluctuations in surface temperatures, and adverse impacts on biodiversity, human health and infrastructure . DEIS 5.8.1.1 and 5.8.2. However, the study area for climate change impacts from the project's GHG emissions is inexplicably limited to "the project area for the Proposed Action and the access roads and rail leading to the project area." DEIS, Table 5.0.4 and section 5.8.2.2; .SEPA Climate Change Technical Report, 1.3. Constricting the study area downplays the significant adverse climate change impacts of the project. There is no information in the DEIS about whether there would be specific climate change impacts outside the limited

study area and, if so, where those impacts would occur and the nature of specific impacts. Thus, that information is unavailable to the public and decision makers. Without information about whether there may be climate change impacts outside this limited study area, the DEIS inappropriately concludes that "[t]here would be no unavoidable and significant adverse environmental impacts." DEIS, 5.8.2.8. A revised DEIS and Final DEIS must study, analyze, and fully disclose the climate change impacts on Washington and Alaska's oceans, shorelines, fish and wildlife, communities and National Wildlife Refuges.

Applying the limited climate change study area, the DEIS and accompanying reports completely fail to analyze ocean acidification stating: "[o]cean acidification is not addressed here since its impacts <u>on</u> the Proposed Action are anticipated to be minimal. SEPA Climate Change Report, 2.4. The failure to provide an analysis of ocean acidification impacts is an egregious omission in the DEIS, particularly as Washington State and Alaska face devastating natural resource and economic losses from ocean acidification of their marine waters. At a minimum, a revised DEIS and the Final EIS must include studies, analysis, and full disclosure of ocean acidification impacts on Washington and Alaska's National Wildlife Refuges, marine waters, shorelines, fish and wildlife resources, and communities.

III. SIGNIFICANT AND UNAVOIDABLE RISKS AND CONSEQUENCES OF VESSSEL ACCIDENTS

The DEIS predicts that the deep-draft vessel traffic (1680 transits transporting 44 million metric tons of coal per year in 80% Panamax and 20% Handymax vessels upon full operation of the terminal) associated with the proposed project would increase the risk of vessel accidents, including collisions, groundings, fires, explosions, and coal and bunker fuel spills. DEIS Table 5.4-15. However, without any explanation the DEIS artificially constricts the vessel study area for indirect impacts upon operation of the facility. As a result, the DEIS avoids disclosure and analysis of significant adverse impacts from vessel accidents along a complete vessel transportation route that would include the Pacific Ocean, Gulf of Alaska, Bering Sea, and Washington and Alaska's coastal oceans and coastlines. Impacts all along the vessel transportation route are reasonably foreseeable, yet the study area for vessel transportation accidents is limited to "waterways that would be used by or could be affected by vessels calling at the project area" but only includes an area "out to 3 nautical miles seaward of the mouth of the Columbia River, the Columbia River Bar, the Columbia River upstream to Vancouver, Washington, and the Willamette River upstream to the Port of Portland." DEIS, 5.4.2. SEPA's implementing regulations do not allow this limitation on the vessel transportation study area. WAC 197-11-060(4)(b). Based on the narrowly defined study area, the rest of the chapter leaves unanalyzed impacts all along the vessel

transportation route outside the limited study area. Unless the project's vessels plan to stop abruptly at 3 nautical miles seaward of the Columbia River's mouth, or for some reason unexplained by the DEIS no vessel transportation accident could ever occur outside this area, there is no basis for the truncation of this important study area.

Alaska and Washington's oceans and coastlines are the site of important National Wildlife Refuges including the Alaska Maritime National Wildlife Refuge, Grays Harbor National Wildlife Refuge, and the Washington Maritime National Wildlife Refuge Complex. Significantly, the vessel study area does not take into account the entire vessel route to and from Asia along Washington State's and Alaska's coastal oceans and coastlines and including through the Aleutian Islands of Alaska. The Aleutian Islands are included in the Alaska Maritime National Wildlife Refuge. The North Pacific Great Circle Route traveled by vessels to Asia passes through the Aleutian Islands in two places. The seas around the Aleutian Islands are known to be some of the most dangerous for shipping in the United States, due to marine conditions including extreme weather and rough seas. These waters have a long history of marine casualties and resulting environmental harm. Nuka Research & Planning Group, LLC and Pearson Consulting, LLC. Aleutian Islands Risk Assessment, Phase B – Final Program Report. March 2016. http://www.aleutianriskassessment.com/images/160310_AIRA_Phase_B_Final_Program_Report.pdf. In 2012, a total of 1,961 large deep-draft vessels made 4,615 recorded transits through Unimak Pass in the Aleutian Islands where there is still inadequate emergency and spill prevention and response systems in place to prevent loss of life and environmental harm. Nuka Research & Planning Group LLC, 2012 Transits of Unimak Pass. September 2014. http://www.aleutianriskassessment.com/files/141125_AIRA_UnimakTransitsUpdate_FINAL.pdf This is more large commercial vessel transits than in the DEIS's constricted study area for the same period (3,178 for year 2012 – DEIS, Table 5.4-7; 3,862 for year 2014– DEIS, 5.4-14). Many other types and sizes of vessels also operate in Unimak Pass and throughout the Aleutian Islands. Foreign flagged ships transiting Unimak Pass, an international strait, are on "innocent passage" and thus are exempt from U.S. Coast Guard regulations. Also adding to the accident risks, there are no shipping lanes and no notification or pilotage requirements in this Pass.

The number of large commercial vessels transiting the Aleutian Islands is expected to rise not only from shipping along the North Pacific Great Circle Route to and from Asia but also from vessels increasingly transiting the Northern Sea Route as Arctic sea ice recedes (due to climate change impacts of GHG emissions). There are ample information sources about the existing conditions and accident history available to the agencies, including references in the readily available Aleutian Island Risk Assessment project, available at: http://www.aleutianriskassessment.com/.

The DEIS concludes that the MBTL would increase the risk of vessel accidents involving collisions, powered and drift groundings, explosion and/or fires, and other emergencies in the study area compared to both the existing condition and the No Action Alternative due to the increase in vessel traffic from the project. These accidents can result in spillage of heavy bunker fuel oil (the consequences of which are acknowledged by the DEIS to be severe in the marine environment and more difficult to clean up, DEIS 5.4-44 and 45) and/or coal. One example of a vessel accident that resulted in a bunker fuel spill occurred in Unimak Pass in the Aleutian Islands off the Alaska Maritime National Wildlife Refuge in 2004. In that incident, a Malaysian-registered bulk grain carrier, *M/V Selendang Ayu*, traveling from Seattle to China went adrift just past Unimak Pass, ran aground and broke apart on Unalaska Island during a storm. The accident resulted in the death of six crew members when a U.S. Coast Guard (USCG) rescue helicopter crashed. The event also resulted in a spill of 340,000 gallons of heavy bunker fuel and the ship's cargo of soybeans. Due to bad weather and the near absence of oil-spill-cleanup capability, nearly none of the oil was recovered. The oil coated twenty miles of the Alaska Maritime National Wildlife Refuge coastline. Some 1,700 seabird carcasses were found, but this is believed to be only a fraction of the number of birds killed. Only 29 birds were rescued. The incident also endangered commercial fisheries. In view of this accident, it is clear that not only a massive amount of bunker fuel could be spilled from operation of the proposed project, but that an entire cargo of coal could be spilled.

A project vessel accident in waters surrounding Washington and Alaska's National Wildlife Refuges could have devastating impacts on fish and wildlife as discussed in section IV below. The DEIS identifies the risk and consequences of such accidents even in the limited study area as unavoidable and significant adverse environmental impacts of the MBTL coal export proposal. DEIS 5.4.8. This finding supports selection of the No Action Alternative. The absence in the DEIS of analysis of vessel transportation impacts along the entire vessel route, however, leaves the public and decision makers uninformed about additional significant risks and consequences of the project. A revised DEIS and the Final EIS must expand the vessel accident study area and include studies, analysis, and full disclosure of vessel accident risks and consequences along the entire vessel route. Impacts of accidents must include impacts along Washington and Alaska's coastal waters and coastlines and to the states' National Wildlife Refuges and fish and wildlife species. This analysis will further support selection of the No Action Alternative.

The only "mitigation" offered by applicant is to attend a safety committee meeting once a year and refrain from bunkering at docks 2 and 3 (DEIS 5.4.7). Attending annual meetings is no mitigation at all. It would not lower the severity of a vessel accident, would not effectively lower risks of accidents resulting from such a significant increase

in vessel traffic, and would not ensure avoidance of consequences of vessel accidents even in the limited study area. Nor would applicant's attendance at annual meetings concerning the Columbia River serve as mitigation or effectively lower risks and consequences of vessel accidents in the study area or along the rest of the vessel transportation route to and from Asia, particularly in areas like Unimak Pass.

IV. SIGNIFICANT ADVERSE IMPACTS ON FISH AND WIDLIFE

The DEIS inappropriately avoids adequate analysis of significant adverse impacts on fish and wildlife species and habitats from greenhouse gas and mercury emissions, climate change, ocean acidification, and vessel transportation. Among other things the DEIS fails to study, analyze and disclose impacts on migratory fish and wildlife species shared by Washington and Alaska and on resident species dependent upon National Wildlife Refuges in the two states. Indeed, the only mention of any National Wildlife Refuge is to a deer study on the Julia Butler Hanson National Wildlife Refuge in the 1970s and a discussion of impacts on the upper estuary islands subpopulation of the federal and state listed Columbia White-Tailed Deer. SEPA Wildlife Technical Report (Wildlife Report), 2-14. (We note that the DEIS discussion of the Columbia River population of Columbia White-Tailed Deer is deficient in that it fails to study whether the project, in an area where the Deer has been documented to occur, would add further impediments to successful dispersal of this species by hindering Deer movement through the project area. This deficiency must be corrected and mitigation must be developed for this impact, if it would occur.)

Species vulnerable to the adverse impacts of the project but left unaddressed by the DEIS but listed in our scoping comment include Cetaceans and other marine mammals; fish, marine vertebrates and invertebrates, seabirds, water fowl, shorebirds and other birds, terrestrial mammals, phytoplankton, and zooplankton. The DEIS further fails to discuss and analyze significant impacts of the project on fisheries, economies, and communities dependent on the health of the National Wildlife Refuges. Given the decision makers' status as trustees of the Public Trust obliged to protect the Refuges' resources, and combined with SEPA and NEPA's public trust obligations, the DEIS should have taken special care to analyze impacts on fish and wildlife protected by the refuges. The DEIS avoids any analysis of impacts on the vast majority of these refuges' fish and wildlife species by artificially constricting the fish and wildlife study areas and, in turn, narrowly limiting species considered in the DEIS. As a result, the DEIS inappropriately concludes the project would have no unavoidable and significant adverse environmental impacts on fish and wildlife. A revised DEIS and the Final EIS must correct this deficiency.

A. <u>Impacts on Fish and Wildlife from Greenhouse Gas and Mercury Emissions, Climate Change, and Ocean Acidification</u>

No part of the DEIS discusses the impacts of the project's greenhouse gas and mercury emissions or climate change and ocean acidification on fish and wildlife, including fish and wildlife dependent on the environmental health of Alaska and Washington's National Wildlife Refuges. We have set forth some of these impacts above in section II. Omission of these impacts on fish and wildlife from the DEIS is unacceptable and deprives the public and decision makers of the complete information they need. The DEIS acknowledges that "[t]he climate impacts of global warming include sea level rise, changes in precipitation and snowpack patterns, ocean acidification, wildfire seasons, and fluctuations in surface temperatures" (DEIS 5.8-9) and states that "[s]tudies have found, in general, that climate change could result in changes in precipitation, temperature, and storm intensity and could increase risks of damage from flooding, drought, heat waves, winds, and storm surge (DEIS 5.8.2). That increases in greenhouse gas emissions can adversely affect "biodiversity" is mentioned as a result of higher global surface temperatures in the explanation of the "greenhouse gas effect." DEIS 5.8-3. The DEIS study area for climate change from construction and operation of the project is "the project area for the Proposed Action and the access roads and rail leading to the project area." DEIS 5.8.2.2. Analyzing climate change impacts to this narrowly defined study area, the DEIS finds no significant impacts from changes in temperature, precipitation, snowfall, sea-level rise "that could affect construction and operation" of the project " DEIS 5.8.2.8. Wildfires as a result of hotter and drier summers are discussed in DEIS, 5-8-32, but only insofar as they might impact the project's "service disruption." A revised DEIS and the Final DEIS must study, analyze and disclose climate change impacts on fish and wildlife, including those dependent upon Alaska and Washington's Natural Wildlife Refuges

The DEIS discusses ocean acidification and recognizes that it results "in changes in seawater carbonate chemistry that can affect marine organisms such as shellfish. Biological impacts from ocean acidification are expected to vary but could be significant." DEIS 5.8-25. Despite this statement the DEIS provides no further information about ocean acidification impacts on shellfish or other marine life. A revised DEIS and the Final EIS must include consideration of these significant adverse impacts on fish and wildlife, not just on shellfish but on all calcareous invertebrates including oysters, pteropods, and euphasiids that are essential prey animals of marine mammals and commercially important fish species including salmon. Ocean acidification impacts on Alaska's corals must also be studied, analyzed, and disclosed.

B. <u>Impacts of Vessel Accidents on Fish and Wildlife</u>

The federally protected National Wildlife Refuges in Washington State and Alaska and the waters offshore from them as well as refuges along the Columbia River provide habitat for significant populations of seabirds, songbirds, and shorebirds; marine

mammals including Orca Whales and other whale species; and fish species including bull trout; steelhead trout; and Chinook, chum, Coho, sockeye, and pink salmon. The Federally Endangered Species Act (ESA) listed endangered Southern Resident Orca Whales as well as other species of whales feed outside the mouth of the Columbia River and along the coast to the north of the River's mouth. Chinook salmon is the preferred food of the Southern Resident Orcas and their birth rates are strongly correlated with the abundance of this salmon species. An collision, grounding or other accident involving spillage of bunker fuel and/or coal from a vessel could devastate fish, including Chinook salmon, Orca whales and other whale species, and/or other wildlife populations protected by the two states' National Wildlife Refuges. See discussion in section III recounting the consequences of an accident involving the *M/V Selendang Ayu* off the Alaska Maritime National Wildlife Refuge. Not only was 340,000 gallons of heavy bunker fuel spilled in that accident but the ship's entire cargo of soybeans also spilled. Not only bunker fuel but also coal could be spilled in an accident involving the project's vessels. Based on the artificially constricted study areas for fish and wildlife species, the DEIS omits consideration of significant impacts of vessel accidents such as collisions and groundings on fish and wildlife depriving the public and decision makers of important information. In light of this omission, no legitimate conclusion can be drawn that there would be no unavoidable significant impacts on fish and wildlife from vessel accidents.

The DEIS acknowledges that collisions and groundings can result in spillage of bunker fuel, 5.4-43, and that increase in vessel traffic associated with the project will increase the risk of vessel accidents and spills of bunker fuel. DEIS, 5.4-43 and 44. Despite recognizing that bunker fuel spills from vessel accidents can be severe in the marine environment and more difficult to clean up, DEIS 5.4-44 and 45, and would result in "potential toxic acute or subacute impacts that could affect the respiration, growth, or reproduction of the affected fish" 4.7-28, the Fish and Wildlife portion of the DEIS only considers the impacts of small (e.g., less than 50 gallons) spills of fuel on fish (but not on marine mammals) associated with bunkering. 4.7-28. A revised DEIS and Final EIS must include studies, analysis, and full disclosure of all vessel accident impacts including spillage of bunker fuel and spillage of coal cargo on fish and wildlife at the coal terminal and along the entire vessel transportation route including in the lower Columbia River, along Washington's and Alaska's coasts and in the states' coastal oceans including areas where fish and wildlife species are protected by National Wildlife Refuges.

C. <u>Impacts of Underwater Noise and Vessel Strikes on Marine Mammals</u>

Marine mammals, especially Ceteceans, depend on sound to communicate, find food, reproduce, detect predators and hazards, navigate, and sense their surroundings.

The increasing large commercial vessel traffic is also increasing the amount of human-produced ocean sound that functions as noise for marine mammals. Large commercial vessels, including the large bulk carriers, including the 1680 incoming and outgoing vessels that would be used by MBTL for its shipments to Asia, produce loud and predominantly low frequency sounds. Sounds can emanate from ships' propellers, machinery, hull passage through the water, and the increasing use of sonar and depth sounders. Low-intensity sound, in particular, can travel over great distances and encompass a large area of impact. These noises may be heard over millions of square kilometers of the ocean not only in the Columbia River near the project, but all along the vessel route to Asia. Some results of noise impacts on marine mammals include: stress; hearing damage; strandings; displacement from critical feeding and breeding grounds; avoidance and shifts in migration paths; and changes in vocalizations (including decrease), respiration, swim speed, diving, and foraging behavior. Weilgart, L.S. 2007. A Brief Review of Known Effects of Noise on Marine Mammals. International Journal of Comparative Psychology. 20, 159-168. Available from: http://www.comparativepsychology.org/ijcp-vol20-2-3-2007/07.Weilgart_PDF.pdf.

The DEIS acknowledges that the increase in deep draft vessels traffic can result in adverse impacts from large vessel underwater noise (DEIS, 5.4-45). It also acknowledges that there is a greater incidence of vessel strikes with whales than other marine mammals. DEIS 4.8.-24. But the study area (the same for direct and indirect impacts for large vessel noise impacts and vessel strikes on marine mammals, Wildlife Report, 1.3) is artificially limited to "the main channel of the Columbia River and extends approximately 5.1 miles upstream and 2.1 miles downstream in the Columbia River, measured respectively, from the upstream and downstream extents of the proposed docks (Docks 2 and 3) at the project area." SEPA Wildlife Technical Report (Wildlife Report) 1.3.1.2.and Figure 4. As a result, the only order of marine mammal for which vessel noise impacts and vessel were considered is pinnipeds including three species found in the lower Columbia River that swim through the study site. DEIS 4.8.3.3; 4.8.4; Wildlife Report, 3.1.1.4. The DEIS basically concludes that these sea lion and seal species will probably just get used to the additional vessel noise and probably get out of the way of the project's 1680 massive bulkers. DEIS 4.8-24 and 4.8-25; Wildlife Report 3-23 and 3-21. These conclusions may be questionable in themselves: they are based on speculation ("…it is *likely* that an individual would have the ability to avoid and swim away from the vessel." "Any response to project-related vessel noise would *likely* be minimal." Emphasis added). The cumulative impacts analysis adds nothing to the discussion because it merely repeats these speculative conclusions without any real analysis of the cumulative impacts of noise and vessel strikes from the project vessels in isolation and when added to other reasonably foreseeable vessel transportation projects. DEIS 6-33.

The DEIS omits studies, analysis and disclosure of increased vessel noise and vessel strike impacts on Cetaceans and other marine mammals along the vessel route outside the constricted study area in Washington and Alaska's coastal oceans and along the states' coastlines. The DEIS fails to contain this analysis despite the fact that Washington's iconic endangered Southern Resident Orcas feed outside the mouth of the Columbia River and along the coast to the north and south of the River as do Humpback and other whales. Unless the project's vessels plan to cut their engines and other noise generating equipment just outside the MBTL terminal, a revised DEIS and Final DEIS must include the significant and unavoidable impacts of vessel noise and marine mammal strikes all along the vessel route. The agencies must study, analyze and fully disclose the impacts on Orca whales and all other Cetaceans and other marine mammals all along the vessel route outside the artificially drawn study area before the DEIS could reasonably conclude there would be no unavoidable significant impacts on marine mammals from vessel transportation-related noise and strikes.

D. <u>Impacts on Fish from Wake Stranding</u>

Wake stranding of fish from the increased number of deep-draft vessels for the project is a significant adverse impact. Wake stranding kills and injures fish because vessel wake lifts them onto the shoreline. Among other things, the fish in the lower Columbia River sustain marine birds and mammals, including Washington's Southern Resident Orca whales. The DEIS acknowledges that the increase in vessel traffic from the project would contribute to wake standing of fish, DEIS 4.7-32, and that a growing body of evidence "that juvenile salmon and other fish are at risk of stranding on wide, gently sloping beaches because of wakes generated by deep draft vessel passage ," DEIS 4.7-18 and 4.7-31; SEPA Fish Technical Report (Fish Report) 2.2.2.7 and 3-23. The DEIS concludes that "Subyearling Chinook salmon appear to be more susceptible to stranding, accounting for approximately 80% of the fish stranded by vessel wakes along the lower Columbia River." DEIS 4.7-31, Fish Report 3-25 (the studies cited in the report demonstrate this is more significant than an "appearance").

According to the DEIS, project vessels (which the DEIS numbers at 840 but that is only the number of vessels traveling one way, the actual number would be 1680) would "introduce additional permanent risk of fish stranding in the Columbia River." DEIS 4.7-18. The DEIS fails to analyze how many juvenile Chinook salmon would be stranded annually. There is no real analysis of whether or why this impact might be or not be entirely avoided except the DEIS says slowing vessels "*could*" reduce wake at Barlow Point. DEIS 4.7-19. No mitigation measure identified in the DEIS addresses wake stranding. DEIS 4.7.7. There is no quantitative cumulative impacts analysis of repeated wake stranding of juvenile Chinook salmon and other fish from the cumulative project vessel traffic in isolation or in the context of increasing cumulative vessel traffic

in the Columbia River. How many fish would be stranded and how would this impact the overall population of Chinook salmon and the marine birds and mammals that depend upon this food source? The DEIS, 6-31 and 32, merely concludes that increased vessel traffic associated with the cumulative projects could increase the potential for fish stranding caused by vessel wakes. Nevertheless, the DEIS erroneously concludes with regard to all impacts on fish including wake stranding "[c]ompliance with laws and implementation of voluntary measures and mitigation measures described above would reduce impacts on fish. There would be no unavoidable and significant adverse impact." DEIS 4.7.8. This conclusion is without basis with regard to wake stranding, particularly in light of the omissions in the analysis. A revised DEIS and the Final EIS must study, analyze, and fully disclose the impacts on fish of wake stranding over the life of the project and must identify effective mitigation. Moreover, impacts of fish wake stranding on marine birds and marine mammals that depend on live fish as their food source (including affected birds and mammals outside the narrow study area) must be included in a revised analysis.

E. Impacts of Releases of Non-native or Invasive Species in Ballast Water or from Ship Fouling

Significant adverse impacts result from the introduction of invasive aquatic species into the marine environment including competition for food with indigenous fish, shellfish, and birds. Some invasive marine species could irreparably and permanently alter the invaded marine ecosystem. The coastal areas of Alaska are already experiencing the effects of invasions by aquatic species. These species are most commonly introduced through ballast water exchange, although ballast water may also be released during an accident or other emergency event. Alien aquatic species are also released from fouled hulls or other vessel structures and equipment.

The DEIS inappropriately avoids any analysis of releases of non-native or invasive species in ballast water or from ship fouling and does not provide mitigation for this impact by merely referencing U.S. Coast Guard and Washington State regulations. There is no discussion of what these regulations would require of vessels calling on MBTL or whether and how effective those regulations would be in controlling invasive species for the vessels that would be calling on MBTL from foreign ports. Compliance with existing regulations cannot be used as mitigation. A revised DEIS and the Final EIS must correct this flaw.

V. CUMULATIVE IMPACTS

The DEIS acknowledges that cumulative impacts "can result from individually minor but collectively significant actions that occur over time." DEIS 6.1. Thus, a careful analysis of cumulative impacts can reveal new significant and unavoidable

impacts of MBTL's proposed project when added to all past, present and reasonably foreseeable future actions even if construction and operation of MBTL's project alone would not result in significant and unavoidable impacts. "The purpose of the cumulative impacts analysis is to ensure that decision-makers consider the full range of consequences for the Proposed Action, including the Proposed Action's incremental contribution to cumulative impacts on the environment." Unfortunately, the cumulative impacts chapter in the DEIS does not provide enough information or analysis with which decision makers can assess the full range of consequences of their actions. Indeed, Chapter 6 fails of its stated purpose: to address how the cumulative increases in, for example, vessel transportation, would *actually impact* fish and wildlife. As one example, the DEIS concludes that the risk of large and small bunker fuel oil spills from vessels would increase 6-58. This is an obvious conclusion from cumulative increases in vessel traffic, but the DEIS does not address the consequences of cumulative oil spills or resulting impacts on fish and aquatic wildlife and fisheries resources of increasing oil spills. As noted in section IV.D. above, there is no quantitative cumulative impacts analysis of repeated wake stranding of juvenile Chinook salmon and other fish and no indication whether the cumulative vessel transportation from either the project's vessels in isolation or combined with all cumulative vessel traffic would result in wake stranding becoming a significant unavoidable impact . See DEIS 6-31 and 32. Little additional information has been generated or disclosed in DEIS Chapter 6 beyond what has already been presented in earlier chapters and there is no discussion of whether any cumulative impact on any fish or wildlife species would create an unavoidable impact to that resource.

Like resource study areas, cumulative impacts study areas are artificially constrained in the DEIS and the DEIS fails to fully disclose the cumulative risks and consequences of oil and coal spillage for fish and wildlife, including fish and wildlife protected by National Wildlife Refuges in Washington and Alaska, cumulative noise and vessel strike impacts on Ceteceans and other marine mammals (other than pinnipeds in the Columbia River near the project area), cumulative impacts of releases non-native and invasive species outside the study area, etc. Chapter 6 also fails to include all projects that could result in cumulative impacts from increased vessels along the vessel route. As one example, the Kinder Morgan Trans Mountain Expansion (tar sands diluted bitumen export) project recently approved by the Canada Energy Board would result in a sevenfold increase in oil tankers transiting along Washington's and Alaska's oceans and coastlines and along the North Pacific Great Circle Route (including through the Aleutian Islands) to Asia. Additionally, after failing to develop quantitative and qualitative studies of cumulative impacts of increased vessel traffic on fish and marine mammal species, the DEIS makes the following unacceptably vague and speculative statement that mitigation measures "similar" to those in Chapter 4 "[I]t is likely that

similar measures would be implemented for the cumulative projects, thus reducing the potential impacts in similar ways." DEIS, 6-33.

The cumulative impacts of the project's operation on fish and wildlife resources, including species along the vessel route outside the limited study areas and species protected by Washington and Alaska's National Wildlife Refuges must be studied, analyzed and disclosed in a revised DEIS and the Final EIS. Consequences on fish and wildlife from increasing vessel traffic impacts must be included. Cumulative impacts of the project's operation in isolation and when combined with other actions must be included. In the absence of this information, decision makers cannot make a fully informed decision.

VI CONCLUSION

The DEIS identified significant and unavoidable adverse impacts from construction and operation of the proposed project on the following nine resource areas that would not be eliminated even if mitigated: greenhouse gas emissions, vessel transportation, tribal resources, social and community resources, cultural resources, rail transportation, rail safety, vehicle transportation, and noise and vibration. The DEIS's finding of "significant and unavoidable adverse impact" for any *one* of these resource areas mandates selection of the No Action Alternative. Nevertheless, the DEIS is deficient in important respects that we have set forth above. The DEIS failed to include studies, analysis, and full disclosure of impacts not only on the narrowly defined study areas, but also importantly on Washington and Alaska's coastal oceans, coastlines, fish and wildlife and economies dependent on healthy National Wildlife Refuges. The omission of these impacts from the EIS deprives the public and the decision makers of complete information about significant environmental consequences of MBTL's proposed project. The DEIS's omissions and deficiencies are so significant that a revised DEIS must be issued to include impacts we have addressed and the Final EIS must also include these impacts.

Washington State is currently respected as a leader in the development of clean energy and fuel transportation policies. Approval of permits for this fossil fuel project on the foundation of this incomplete and flawed DEIS would sully this status and would be counter to the work the state has done to address greenhouse gas emissions that are contributing to severe changes to the climate and acidification of oceans. Among other things, in light of the present climate crisis, it is inconceivable that agency decision makers would fail to perform their duties as trustees of the Public Trust protecting the air, atmosphere, water, wildlife, communities, and economies in this matter. They must choose the No Action Alternative and deny permits for the project.

Respectfully submitted by,

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May 24, 2016

Millennium Bulk Terminals -- Longview SEPA EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, Washington 98104
U.S. Army Corps of Engineers
Washington Department of Ecology
Cowlitz County Commission

Subject: Docket number 2013-19738: Comments on DEIS for Millennium Bulk Terminals Longview LLC Coal Export Terminal

To Whom It May Concern:

Thank you for this opportunity to comment on the proposed Millennium Bulk Terminals - Longview DEIS.

FOGH (Friends of Grays Harbor) is a broad-based 100% volunteer tax-exempt 501(c)(3) citizens group made up of crabbers, fishers, oyster growers and caring citizens. The mission of FOGH is to foster and promote the economic, biological, and social uniqueness of Washington's estuaries and ocean coastal environments. The goal of FOGH is to protect the natural environment, human health and safety in Grays Harbor and vicinity through science, advocacy, law, activism and empowerment. We oppose locating any coal or other fossil fuel terminals in the State of Washington, and any expansion of such terminals elsewhere.

Coal presents a threat to human health and safety from the time it is mined to when it is burned. Washington State is a leader in clean energy and should not be approving the transport and storing of so dangerous a fossil fuel. In addition, the increase in rail traffic creates a multitude of problems for communities along the rail routes.

We find the following to be significant adverse impacts and are concerned that they were inadequately addressed in the SEPA/NEPA review process.

Human Health and Safety:

☐ Dust from the trains and the storage piles contains toxic materials and heavy metals causing human health hazards and carbon dioxide emissions. Arsenic from coal can accumulate in soils near the coal trains.

☐ Coal dust is highly combustible creating unacceptable and dangerous fire hazards. Powder River Basin coal can spontaneously combust.

☐ Dust can travel for miles and will contaminate agricultural lands along the rail route and near the terminal.

☐ Coal dust pollution will degrade waters near the terminals, en route from the trains, and from coal ships as they cross the Pacific Ocean

continued on page 2

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http:fogh.org rd@fogh.org 501(c)(3) tax-deductible

☐ Coal mining is a hazardous activity that produces known illnesses, injury, and death.

☐ Coal trains emit Nitrogen and Sulfur Oxides, which creates acid rain.

☐ Train derailments can occur due to accumulation of coal dust on the rails. The chance of rail collisions has the potential to increase by 22% throughout Cowlitz County and Washington.

☐ The coal will be shipped to Asia, where it will be burned, causing horrible health problems for the people and increasing climate change. Coal is the leading producer of carbon dioxide.

☐ Coal burned in Asia will cause air pollution on the U.S. West Coast.

☐ 5.7 million tons of coal will be exported from Longview. When burned it will release 10.3 million metric tons of carbon dioxide. If the company ships 80 million tons, as internal documents indicate, that coal would produce more than 130 million metric tons of carbon pollution, roughly equivalent to the emission from all the gasoline burned annually in Washington, Oregon, Idaho, Montana, Wyoming, Nevada, and more than half of California—combined.

Economics:

☐ Increased rail traffic will create frequently blocked crossings, which will impact all businesses along the routes.

☐ Increased presence of large ships in the shipping channels will impact current users and increase the risk of collisions and other mishaps.

☐ Local communities will bear the expense of at least 90% of the costs of rail crossing improve ments. In most cases this expense will have little benefit to that communit .

☐ Marine resource jobs will be greatly impacted by coal pollution and increased shipping traffic

☐ Aquatic resources will be greatly impacted by a spill and the buring of the coal, potentially raising mercury levels and loss of habitat.

☐ Emergency access in the communities along the rail routes will be greatly impaired by the increased train traffic

☐ Coal companies are receiving subsidies at the expense of our economy.

☐ Property values decrease near coal terminals.

☐ Coal as an international commodity is declining. The terminal will be built and ultimately lie dormant - a waste of time and money.

☐ Ocean acidification will only be increased as we continue to use and abuse fossil fuels. Our marine resource economy provides sustainable economic value to both tribal and non-tribal communities. Treaty rights and our coastal communities cannot be ignored by inappropriate development.

Sincerely,

Arthur (R.D.) Grunbaum
President

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June 12, 2016

Cowlitz County
Washington Department of Ecology &
U.S. Army Corps of Engineers
c/o ICF International
Via email at https://public.commentworks.com/cwx/mbtldeiscommentform/

Re: Public Comment on Millennium Bulk Terminals - Longview, LLC Project SEPA/NEPA Environmental Impact Statements, SEPA Draft Environmental Impact Statement

Dear Agency Representatives:

Thank you for this opportunity to provide public comment on the Draft Environmental Impact Statement (DEIS) for the proposed Millennium Bulk Terminals - Longview, LLC project (MBTL or the project). Please accept the following comment on the DEIS from Friends of Alaska National Wildlife Refuges (Friends), FRIENDS of the San Juans (FRIENDS), and Friends of Grays Harbor (FOGH).

We recommend selection of the No Action Alternative. Although the DEIS suffers from omissions and other deficiencies discussed below, the document also confirms that there would be significant and unavoidable environmental impacts from the MBTL that cannot be adequately mitigated. A revised DEIS and Final EIS for the project, based on additional studies and analysis, must correct deficiencies in the DEIS that we have identified below. Correction of these deficiencies is necessary to fully apprise decision makers of the environmental consequences of their decision, disclose factual information on impacts to the public, and lend greater support for the conclusion that the MBTL presents significant unavoidable adverse impacts that cannot be adequately mitigated.

Friends of Alaska National Wildlife Refuges (Friends) is an independent, non-profit organization dedicated to promoting the conservation of the natural resources of all the Alaska National Wildlife Refuges. The Friends promote understanding and appreciation of these refuges and assist the U.S. Fish and Wildlife Service in meeting its mandates. Our work includes educating the public and decision makers on local, national, and international levels about Alaska's National Wildlife Refuges; assisting refuges in accomplishing their missions through wildlife management and habitat

improvement projects and funding refuge oriented projects through grants, memberships, donations, and other activities.

FRIENDS of the San Juans (FRIENDS) is an independent, non-profit organization that advocates for healthy, sustainable communities and has defended natural spaces and wildlife in the San Juan Islands for over 35 years. Our scientists, educators and lawyers provide the expertise that citizens and groups need to protect and preserve the Salish Sea ecosystem. FRIENDS is concerned about the marine impacts associated with the MBTL project – many of the concerns are echoed along the entire shipping route and must be included in the EIS process.

Friends of Grays Harbor (FOGH) is a broad-based 100% volunteer tax-exempt 501(c)(3) citizens group made up of crabbers, fishers, oyster growers, and caring citizens. The mission of FOGH is to foster and promote the economic, biological, and social uniqueness of Washington's estuaries and ocean coastal environments. The goal of FOGH is to protect the natural environment, human health, and safety in Grays Harbor and vicinity through science, advocacy, law, activism, and empowerment. We oppose locating any coal or other fossil fuel terminals in the State of Washington, and any expansion of such terminals elsewhere.

I. INTRODUCTION

The Friends, FRIENDS, and FOGH are deeply concerned about the significant adverse environmental impacts of the proposed project. The scoping comment timely submitted by the Friends, FRIENDS, and FOGH discussed the interconnectedness of significant adverse impacts of the proposed project on the environments, resources, and economies of Washington and Alaska's National Wildlife Refuges. These Refuges are inextricably linked by law (the National Wildlife Refuge System Administration Act of 1966 and National Wildlife Improvement Act of 1997, 16 U.S.C. §§ 668dd -668ee). The biological integrity, fish and wildlife diversity, and environmental health of the Alaska and Washington's Refuges are also interdependent. Among other things, the refuges and marine waters offshore from them support shared migratory species. These shared species include juvenile Pacific salmon – including Chinook salmon –that migrate from their natal streams in Washington State to waters off the Alaska Maritime National Wildlife Refuge and numerous shorebird species that nest in Alaska's National Wildlife Refuges and winter or stopover in Washington State's Refuges. Congress recognized that refuges in the National Wildlife Refuge system serve "a pivotal role in the conservation of migratory birds, anadromous and interjurisdictional fish, marine mammals, endangered and threatened species, and the habitats on which these species depend." Findings §2, National Wildlife Improvement Act of 1997, Pub.L.105-57, 105th Congress.

Although the DEIS contains discussion of significant and unavoidable impacts that support our recommendation of a No Action Alternative, the DEIS fails to include studies, analysis, and full disclosure of significant adverse impacts the project would have on the resources dependent upon and protected by Washington and Alaska's National Wildlife Refuges. The following provisions of SEPA and the rules implementing it are especially relevant to assessing impacts upon these refuges and their fish and wildlife resources: SEPA's purpose statement, RCW 43.21C.010 ("prevent or eliminate damage to the environment and biosphere,"… "enrich the understanding of the ecological systems and natural resources "important to the state and nation"); SEPA's Guidelines for State Agencies and Local Governments, RCW 43.21C.030(f) ("[r]ecognize the worldwide and long-range character of environmental problems… "); and WAC 197-11-060(4)(b) (consideration of a proposal's impacts shall not be limited to "only those aspects within [lead agencies'] jurisdiction"). Even if the agencies conclude that some the project's impacts on Washington and Alaska's coastal oceans, coastlines and National Wildlife Refuges would have a low chance of occurring, these impacts must be included in the EIS if the resulting environmental consequences would be severe. WAC 197-11-794(2). ("An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred.") As one example, the risk of a vessel accident involving a spill of vessel bunker fuel in any particular location may be low but its occurrence could cause severe, even permanent, harm to marine and bird species.

The fish and wildlife species and their habitats protected by Washington and Alaska's National Wildlife Refuges are held in the public trust for the benefit of future generations pursuant to the laws establishing the various refuges. These refuges must be safeguarded as part of the network of related lands, waters, fish, and wildlife for the benefit of present and future generations of Americans. Additionally, the common law Public Trust Doctrine is applicable here. Fish and wildlife have long been recognized as protected elements of the Public Trust Doctrine in our country's jurisprudence. William Blackstone, II Commentaries on the Laws of England ch. 1, 222 (1769) (Blackstone confirmed that within the English legal system that certain elements remain in common ownership, unsusceptible to full privatization: "[S]uch are the elements of light, *air and water . . . also animals ferae naturae*, or of untamable nature . . . "). The agencies must fulfill their special fiduciary duties as trustees of these resources by studying, analyzing, and disclosing the impacts of this project on the refuges and by fully protecting refuge land, shorelines, and tidelines; the air (including the atmosphere) and water quality that sustain them; the species and habitat dependent upon the refuges for survival; and the communities that derive economic benefit from them. In the context of this permitting matter, the applicable common law Public Trust Doctrine means the agencies must not draw artificially constricted geographic boundaries for study areas, use models based on speculation to minimize actual impacts, employ statuary provisions that contain

minimum standards, or accept less than full mitigation of impacts. As currently written, the DEIS's omission of significant impacts and inclusion of ineffective mitigations runs counter to the public trust in the refuges' natural resources. The DEIS must be revised and the revised DEIS as well as the Final EIS must include studies, analysis, and full disclosure of impacts on Alaska and Washington's National Wildlife Refuges, their protected fish and wildlife species; their habitats including land, air, atmosphere, and water; and communities dependent on the health of the refuges. These resources must be fully protected by the agencies.

II. SIGNIFICANT AND UNAVOIDABLE GREENHOUSE GAS EMISSIOINS, TOXIC MERCURY EMISSIONS, INCREASING CLIMATE CHANGE, AND OCEAN ACIDIFICATION

Global climate change and ocean acidification resulting from the project's greenhouse gas (GHG) emissions and toxic mercury emissions were raised in scoping comments by the Friends, FRIENDS and FOGH as a critically important issues. The climate change and ocean acidification impacts on our two states from extracting, transporting, and burning coal are severe, unavoidable, and indisputable. Terrestrial, marine, and freshwater ecosystems and the human communities that rely on them are all deeply affected by climate change. Scientists have confirmed that global warming is accelerating and impacts on fish and wildlife will likewise be more severe than previously thought. Smith S.J., J Edmonds et al. March 2015. Near-term acceleration in the rate of temperature change. Nature Climate Change 5, 333–336. Available at http://www.nature.com/nclimate/journal/v5/n4/full/nclimate2552.html. Rising sea levels threaten shorelines and refuge species including migrating shorebirds. A warming Arctic is already resulting in phenological asychronies between interacting species protected by the refuges that threatens their survival. For example, van Gils, J.A., S .Lisovski et al. May, 2016. Body shrinkage due to Arctic warming reduces red knot fitness in tropical wintering range. Science, Vol. 352, Issue 6287, pp. 819-821. Available at http://science.sciencemag.org/content/352/6287/819. Increasing numbers and intensities of wildfires associated with a warmer and drier climate and drought conditions are destroying wildlife and their habitat in Alaska and Washington. Warmer oceans threaten fish (including Pacific salmon species and marine mammals that thrive on salmon including Washington State's iconic Southern Resident Orca whales) and fisheries. Species' extinction rates are expected to increase and even accelerate. Urban, M. C. May 2015. Report: Accelerating extinction risk from climate change. Science, Vol. 348, Issue 6234, pp. 571-573. Available at: http://science.sciencemag.org/content/348/6234/571.full.

Ocean acidification is also a grave consequence of increasing anthropogenic CO2 in the atmosphere. Marine waters in Washington and Alaska are becoming more

acidic undermining marine biodiversity and commercial fishing enterprises by hampering the ability of calcareous invertebrates such as shellfish, oysters, and prey species to build shells. Mercury, a potent neurotoxin, released into the air from coal fired power plants in Asia travels across the Pacific to Alaska and Washington States by the atmosphere and oceans. Mercury converts to methylmercury in aquatic environments and enters the marine food web and the food chain.

A. Greenhouse Gas and Mercury Emissions

The project, if permitted, would transport 44 million metric tons of coal per year to Asia. Burning this coal would produce over 90 million metric tons (MMT) of CO2e annually upon full operation of the project, DEIS 5.8-22, and the project would induce more demand for coal in Asia, DEIS 5.8-6. The DEIS recognizes that there would be significant and unavoidable adverse environmental impacts from emissions of greenhouse gases (GHG) if the terminal is permitted, DEIS 5.8-22, and on this basis the No Action Alternative must be selected.

The DEIS analysis for emissions of CO2e is based on the expected transportation routes and emissions from the combustion of coal in Asia. The DEIS properly includes these activities in its GHG emissions determination. The DEIS demonstrates that GHG emissions from rail and vessel transportation of 44 MMT of coal alone would make this project one of the largest GHG emitters in Washington State. DEIS 5.8-14. The DEIS analysis is deficient, however, in that the GHG emissions analysis fails to capture the full life cycle of GHG impacts by omitting emissions from the extraction of coal. The DEIS says that analysis of coal extraction is part of NEPA analysis for coal mines. Since with a few exceptions, a federal emission analysis for mines does not include emissions from transportation (SEPA Greenhouse Gas Emissions Technical Report[GHG Technical Report], 4.2, Table 60) or analysis of coal combustion, and the MBTL DEIS does not include extraction, there is no disclosure and analysis of the total GHG emissions in the DEIS. The DEIS approach is contrary to letters written by the Department of Ecology to the Bureau of Land Management in 2011 concerning the need for a supplemental EIS for the Wright Area Coal Lease application and to the US Department of Transportation in 2013 concerning the Tongue River Railroad. See also, Secretary of the Interior. January 15, 2016. Order No. 3338. Discretionary Programmatic Environmental Impact Statement to Modernize the Federal Coal Program. A revised DEIS and the Final EIS must include studies, analysis, and disclosure emissions from extraction of the coal in its calculation of GHG.

While it may be understandable for the DEIS to assess how markets would react to cheaper coal exported from this project, the method of this assessment and its underlying assumptions must be credible and comprehensible and must not understate or minimize the project's actual contribution to GHG emissions. As written, the DEIS

significantly minimizes likely GHG emissions impacts by applying apparently inconsistent premises and using complex models based on speculation about future coal markets and energy policy conditions. The GHG analysis includes an unwarranted hypothesis that the coal exported by MBTL *could* displace the burning of other types of coal. DEIS 5.8-6. This is inconsistent with the determination that the MBTL *would* induce greater demand for coal in Asia. DEIS 5.8-6. The complex econometric projections and multi-dimensional models used in the DEIS yield four widely varying scenarios. The explanation and application of these models in the DEIS and GHG Technical Report is presented as a "black box" analysis that resists full comprehension.

Using the "preferred 2015 Energy Policy scenario" (which assumes timely effective implementation and continuation of international agreements and federal and state energy policies – assumptions that may or may not prove reliable), the DEIS ratchets down the annual emissions of CO2e upon full operation of the MBTL project from 90 MMT annually to an estimated net annual emissions of 3.2 MMT in 2028 (DEIS Table 5.8-8). Thus, the preferred "specialized computer model" dispels nearly 87% of actual annual emissions upon full operation in 2028. And it ratchets down annual net emissions for full operations over a 10-year period (2028-2038) from 900 MMT to 27.855 MMT. (DEIS Table 5.8-.9). Thus, the "specialized computer model" also dispels over 99% of actual emissions over the 10-year period. Then, putting the emissions in "context" the DEIS concludes that the "average annual net missions from the Proposed Action at full operation would be approximately 2.8% (i.e., 2.5 MMT of CO2e annually) of the downstream combustion emissions from the coal that passes through the coal export terminal." DEIS 5.8-22. This dismisses over 99% of the likely annual emissions at full operation. These results do not make common sense given the fact that the project would produce 90 MMT of CO2e annually upon full operation. While generation of conflicting market analyses and speculation about future GHG emissions policies may characterize, describe, and depict a scenario for GHG emissions from this project, minimizing the picture of these emissions does nothing to prevent or mitigate the *actual* emissions. The EIS must present a realistic and credible GHG emissions analysis starting with the fact that at full buildout the project would transport 44 MMT of coal annually burned in Asia to produce over 90 MMT of CO2e annually.

The DEIS requires applicant to submit a plan to the Washington Department of Ecology to reduce GHG emissions "inside or outside of Washington State" by 50% using measures that are "real, permanent, enforceable, verifiable and additional." The DEIS calls for a 50% reduction of the computer model's attenuated level of emissions. Thus this plan, that would only require the reduction of 693,723 metric tons of GHG emissions (50% of 1,387,446 MMT) from 2021 to 2027 and 1.27 MMT (50% of 2.53) of GHG emissions each year 2028-2038, would not effectively reduce the project's actual GHG emissions. Additionally, the required GHG emissions reduction plan must cover

the entire period of the life of the project. The plan covers 17 years, yet the DEIS says "the terminal would be designed for a *minimum* 30-year period of operation." DEIS S-6. The plan must also be based on the CO2e emissions that would actually be produced by the project annually, i.e. 90 MMT at full build out, rather than only a small fraction of that amount.

The models, underlying facts, assumptions, and outcomes should be re-examined carefully and a revised DEIS and Final EIS must add in GHG emissions from coal extraction to ensure all GHG emissions impacts are considered and to make certain that econometric projections will not discount the project's actual emissions to the detriment of the earth's atmosphere. Despite its flaws, the DEIS acknowledges that even if the mitigation measures identified would substantially reduce GHG emissions, they would not eliminate them : "[t]he Proposed Action's remaining projected contribution to greenhouse gas emissions impacts, which are cumulative in nature, *would still be significant and adverse* under the greenhouse gas emissions intensity considerations previously noted ." DEIS 5.8-22, 5.8-16. Emphasis added. On this basis and particularly in light of the applicable Public Trust Doctrine, the No Action Alternative must be selected.

Applying the same econometric models and "black box" analysis used for GHG emissions to mercury and sulfur dioxide emissions (Appendix I, Sulfur Dioxide and Mercury Emissions, Impact Analysis) the DEIS inappropriately finds that no unavoidable and significant environmental impact would result from the project. This analysis must be reworked in a revised DEIS and in the Final DEIS to inform the public and decision makers of the actual mercury deposition that would occur from the combustion of coal as a result project.

B. <u>Climate Change and Ocean Acidification</u>

In the GHG analysis portion of the DEIS, the DEIS acknowledges that "[t]he climate change impacts resulting from this increase to greenhouse gases would persist for a long period of time, beyond the analysis period and are considered permanent … ." DEIS 5.8-16. The DEIS observes that climate change can result in higher global temperatures, sea level rise, changes in precipitation and snowpack patterns, ocean acidification, wildfire seasons, fluctuations in surface temperatures, and adverse impacts on biodiversity, human health and infrastructure . DEIS 5.8.1.1 and 5.8.2. However, the study area for climate change impacts from the project's GHG emissions is inexplicably limited to "the project area for the Proposed Action and the access roads and rail leading to the project area." DEIS, Table 5.0.4 and section 5.8.2.2; .SEPA Climate Change Technical Report, 1.3. Constricting the study area downplays the significant adverse climate change impacts of the project. There is no information in the DEIS about whether there would be specific climate change impacts outside the limited

study area and, if so, where those impacts would occur and the nature of specific impacts. Thus, that information is unavailable to the public and decision makers. Without information about whether there may be climate change impacts outside this limited study area, the DEIS inappropriately concludes that "[t]here would be no unavoidable and significant adverse environmental impacts." DEIS, 5.8.2.8. A revised DEIS and Final DEIS must study, analyze, and fully disclose the climate change impacts on Washington and Alaska's oceans, shorelines, fish and wildlife, communities and National Wildlife Refuges.

Applying the limited climate change study area, the DEIS and accompanying reports completely fail to analyze ocean acidification stating: "[o]cean acidification is not addressed here since its impacts *on* the Proposed Action are anticipated to be minimal. SEPA Climate Change Report, 2.4. The failure to provide an analysis of ocean acidification impacts is an egregious omission in the DEIS, particularly as Washington State and Alaska face devastating natural resource and economic losses from ocean acidification of their marine waters. At a minimum, a revised DEIS and the Final EIS must include studies, analysis, and full disclosure of ocean acidification impacts on Washington and Alaska's National Wildlife Refuges, marine waters, shorelines, fish and wildlife resources, and communities.

III. SIGNIFICANT AND UNAVOIDABLE RISKS AND CONSEQUENCES OF VESSSEL ACCIDENTS

The DEIS predicts that the deep-draft vessel traffic (1680 transits transporting 44 million metric tons of coal per year in 80% Panamax and 20% Handymax vessels upon full operation of the terminal) associated with the proposed project would increase the risk of vessel accidents, including collisions, groundings, fires, explosions, and coal and bunker fuel spills. DEIS Table 5.4-15. However, without any explanation the DEIS artificially constricts the vessel study area for indirect impacts upon operation of the facility. As a result, the DEIS avoids disclosure and analysis of significant adverse impacts from vessel accidents along a complete vessel transportation route that would include the Pacific Ocean, Gulf of Alaska, Bering Sea, and Washington and Alaska's coastal oceans and coastlines. Impacts all along the vessel transportation route are reasonably foreseeable, yet the study area for vessel transportation accidents is limited to "waterways that would be used by or could be affected by vessels calling at the project area" but only includes an area "out to 3 nautical miles seaward of the mouth of the Columbia River, the Columbia River Bar, the Columbia River upstream to Vancouver, Washington, and the Willamette River upstream to the Port of Portland." DEIS, 5.4.2. SEPA's implementing regulations do not allow this limitation on the vessel transportation study area. WAC 197-11-060(4)(b). Based on the narrowly defined study area, the rest of the chapter leaves unanalyzed impacts all along the vessel

transportation route outside the limited study area. Unless the project's vessels plan to stop abruptly at 3 nautical miles seaward of the Columbia River's mouth, or for some reason unexplained by the DEIS no vessel transportation accident could ever occur outside this area, there is no basis for the truncation of this important study area.

Alaska and Washington's oceans and coastlines are the site of important National Wildlife Refuges including the Alaska Maritime National Wildlife Refuge, Grays Harbor National Wildlife Refuge, and the Washington Maritime National Wildlife Refuge Complex. Significantly, the vessel study area does not take into account the entire vessel route to and from Asia along Washington State's and Alaska's coastal oceans and coastlines and including through the Aleutian Islands of Alaska. The Aleutian Islands are included in the Alaska Maritime National Wildlife Refuge. The North Pacific Great Circle Route traveled by vessels to Asia passes through the Aleutian Islands in two places. The seas around the Aleutian Islands are known to be some of the most dangerous for shipping in the United States, due to marine conditions including extreme weather and rough seas. These waters have a long history of marine casualties and resulting environmental harm. Nuka Research & Planning Group, LLC and Pearson Consulting, LLC. Aleutian Islands Risk Assessment, Phase B – Final Program Report. March 2016. http://www.aleutianriskassessment.com/images/160310_AIRA_Phase_B_Final_Program_Report.pdf. In 2012, a total of 1,961 large deep-draft vessels made 4,615 recorded transits through Unimak Pass in the Aleutian Islands where there is still inadequate emergency and spill prevention and response systems in place to prevent loss of life and environmental harm. Nuka Research & Planning Group LLC, 2012 Transits of Unimak Pass. September 2014. http://www.aleutianriskassessment.com/files/141125_AIRA_UnimakTransitsUpdate_FINAL.pdf This is more large commercial vessel transits than in the DEIS's constricted study area for the same period (3,178 for year 2012 – DEIS, Table 5.4-7; 3,862 for year 2014– DEIS, 5.4-14). Many other types and sizes of vessels also operate in Unimak Pass and throughout the Aleutian Islands. Foreign flagged ships transiting Unimak Pass, an international strait, are on "innocent passage" and thus are exempt from U.S. Coast Guard regulations. Also adding to the accident risks, there are no shipping lanes and no notification or pilotage requirements in this Pass.

The number of large commercial vessels transiting the Aleutian Islands is expected to rise not only from shipping along the North Pacific Great Circle Route to and from Asia but also from vessels increasingly transiting the Northern Sea Route as Arctic sea ice recedes (due to climate change impacts of GHG emissions). There are ample information sources about the existing conditions and accident history available to the agencies, including references in the readily available Aleutian Island Risk Assessment project, available at: http://www.aleutianriskassessment.com/.

The DEIS concludes that the MBTL would increase the risk of vessel accidents involving collisions, powered and drift groundings, explosion and/or fires, and other emergencies in the study area compared to both the existing condition and the No Action Alternative due to the increase in vessel traffic from the project. These accidents can result in spillage of heavy bunker fuel oil (the consequences of which are acknowledged by the DEIS to be severe in the marine environment and more difficult to clean up, DEIS 5.4-44 and 45) and/or coal. One example of a vessel accident that resulted in a bunker fuel spill occurred in Unimak Pass in the Aleutian Islands off the Alaska Maritime National Wildlife Refuge in 2004. In that incident, a Malaysian-registered bulk grain carrier, *M/V Selendang Ayu*, traveling from Seattle to China went adrift just past Unimak Pass, ran aground and broke apart on Unalaska Island during a storm. The accident resulted in the death of six crew members when a U.S. Coast Guard (USCG) rescue helicopter crashed. The event also resulted in a spill of 340,000 gallons of heavy bunker fuel and the ship's cargo of soybeans. Due to bad weather and the near absence of oil-spill-cleanup capability, nearly none of the oil was recovered. The oil coated twenty miles of the Alaska Maritime National Wildlife Refuge coastline. Some 1,700 seabird carcasses were found, but this is believed to be only a fraction of the number of birds killed. Only 29 birds were rescued. The incident also endangered commercial fisheries. In view of this accident, it is clear that not only a massive amount of bunker fuel could be spilled from operation of the proposed project, but that an entire cargo of coal could be spilled.

A project vessel accident in waters surrounding Washington and Alaska's National Wildlife Refuges could have devastating impacts on fish and wildlife as discussed in section IV below. The DEIS identifies the risk and consequences of such accidents even in the limited study area as unavoidable and significant adverse environmental impacts of the MBTL coal export proposal. DEIS 5.4.8. This finding supports selection of the No Action Alternative. The absence in the DEIS of analysis of vessel transportation impacts along the entire vessel route, however, leaves the public and decision makers uninformed about additional significant risks and consequences of the project. A revised DEIS and the Final EIS must expand the vessel accident study area and include studies, analysis, and full disclosure of vessel accident risks and consequences along the entire vessel route. Impacts of accidents must include impacts along Washington and Alaska's coastal waters and coastlines and to the states' National Wildlife Refuges and fish and wildlife species. This analysis will further support selection of the No Action Alternative.

The only "mitigation" offered by applicant is to attend a safety committee meeting once a year and refrain from bunkering at docks 2 and 3 (DEIS 5.4.7). Attending annual meetings is no mitigation at all. It would not lower the severity of a vessel accident, would not effectively lower risks of accidents resulting from such a significant increase

in vessel traffic, and would not ensure avoidance of consequences of vessel accidents even in the limited study area. Nor would applicant's attendance at annual meetings concerning the Columbia River serve as mitigation or effectively lower risks and consequences of vessel accidents in the study area or along the rest of the vessel transportation route to and from Asia, particularly in areas like Unimak Pass.

IV. SIGNIFICANT ADVERSE IMPACTS ON FISH AND WIDLIFE

The DEIS inappropriately avoids adequate analysis of significant adverse impacts on fish and wildlife species and habitats from greenhouse gas and mercury emissions, climate change, ocean acidification, and vessel transportation. Among other things the DEIS fails to study, analyze and disclose impacts on migratory fish and wildlife species shared by Washington and Alaska and on resident species dependent upon National Wildlife Refuges in the two states. Indeed, the only mention of any National Wildlife Refuge is to a deer study on the Julia Butler Hanson National Wildlife Refuge in the 1970s and a discussion of impacts on the upper estuary islands subpopulation of the federal and state listed Columbia White-Tailed Deer. SEPA Wildlife Technical Report (Wildlife Report), 2-14. (We note that the DEIS discussion of the Columbia River population of Columbia White-Tailed Deer is deficient in that it fails to study whether the project, in an area where the Deer has been documented to occur, would add further impediments to successful dispersal of this species by hindering Deer movement through the project area. This deficiency must be corrected and mitigation must be developed for this impact, if it would occur.)

Species vulnerable to the adverse impacts of the project but left unaddressed by the DEIS but listed in our scoping comment include Cetaceans and other marine mammals; fish, marine vertebrates and invertebrates, seabirds, water fowl, shorebirds and other birds, terrestrial mammals, phytoplankton, and zooplankton. The DEIS further fails to discuss and analyze significant impacts of the project on fisheries, economies, and communities dependent on the health of the National Wildlife Refuges. Given the decision makers' status as trustees of the Public Trust obliged to protect the Refuges' resources, and combined with SEPA and NEPA's public trust obligations, the DEIS should have taken special care to analyze impacts on fish and wildlife protected by the refuges. The DEIS avoids any analysis of impacts on the vast majority of these refuges' fish and wildlife species by artificially constricting the fish and wildlife study areas and, in turn, narrowly limiting species considered in the DEIS. As a result, the DEIS inappropriately concludes the project would have no unavoidable and significant adverse environmental impacts on fish and wildlife. A revised DEIS and the Final EIS must correct this deficiency.

A. <u>Impacts on Fish and Wildlife from Greenhouse Gas and Mercury Emissions, Climate Change, and Ocean Acidification</u>

No part of the DEIS discusses the impacts of the project's greenhouse gas and mercury emissions or climate change and ocean acidification on fish and wildlife, including fish and wildlife dependent on the environmental health of Alaska and Washington's National Wildlife Refuges. We have set forth some of these impacts above in section II. Omission of these impacts on fish and wildlife from the DEIS is unacceptable and deprives the public and decision makers of the complete information they need. The DEIS acknowledges that "[t]he climate impacts of global warming include sea level rise, changes in precipitation and snowpack patterns, ocean acidification, wildfire seasons, and fluctuations in surface temperatures" (DEIS 5.8-9) and states that "[s]tudies have found, in general, that climate change could result in changes in precipitation, temperature, and storm intensity and could increase risks of damage from flooding, drought, heat waves, winds, and storm surge (DEIS 5.8.2). That increases in greenhouse gas emissions can adversely affect "biodiversity" is mentioned as a result of higher global surface temperatures in the explanation of the "greenhouse gas effect." DEIS 5.8-3. The DEIS study area for climate change from construction and operation of the project is "the project area for the Proposed Action and the access roads and rail leading to the project area." DEIS 5.8.2.2. Analyzing climate change impacts to this narrowly defined study area, the DEIS finds no significant impacts from changes in temperature, precipitation, snowfall, sea-level rise "that could affect construction and operation" of the project " DEIS 5.8.2.8. Wildfires as a result of hotter and drier summers are discussed in DEIS, 5-8-32, but only insofar as they might impact the project's "service disruption." A revised DEIS and the Final DEIS must study, analyze and disclose climate change impacts on fish and wildlife, including those dependent upon Alaska and Washington's Natural Wildlife Refuges

The DEIS discusses ocean acidification and recognizes that it results "in changes in seawater carbonate chemistry that can affect marine organisms such as shellfish. Biological impacts from ocean acidification are expected to vary but could be significant." DEIS 5.8-25. Despite this statement the DEIS provides no further information about ocean acidification impacts on shellfish or other marine life. A revised DEIS and the Final EIS must include consideration of these significant adverse impacts on fish and wildlife, not just on shellfish but on all calcareous invertebrates including oysters, pteropods, and euphasiids that are essential prey animals of marine mammals and commercially important fish species including salmon. Ocean acidification impacts on Alaska's corals must also be studied, analyzed, and disclosed.

B. <u>Impacts of Vessel Accidents on Fish and Wildlife</u>

The federally protected National Wildlife Refuges in Washington State and Alaska and the waters offshore from them as well as refuges along the Columbia River provide habitat for significant populations of seabirds, songbirds, and shorebirds; marine

mammals including Orca Whales and other whale species; and fish species including bull trout; steelhead trout; and Chinook, chum, Coho, sockeye, and pink salmon. The Federally Endangered Species Act (ESA) listed endangered Southern Resident Orca Whales as well as other species of whales feed outside the mouth of the Columbia River and along the coast to the north of the River's mouth. Chinook salmon is the preferred food of the Southern Resident Orcas and their birth rates are strongly correlated with the abundance of this salmon species. An collision, grounding or other accident involving spillage of bunker fuel and/or coal from a vessel could devastate fish, including Chinook salmon, Orca whales and other whale species, and/or other wildlife populations protected by the two states' National Wildlife Refuges. See discussion in section III recounting the consequences of an accident involving the *M/V Selendang Ayu* off the Alaska Maritime National Wildlife Refuge. Not only was 340,000 gallons of heavy bunker fuel spilled in that accident but the ship's entire cargo of soybeans also spilled. Not only bunker fuel but also coal could be spilled in an accident involving the project's vessels. Based on the artificially constricted study areas for fish and wildlife species, the DEIS omits consideration of significant impacts of vessel accidents such as collisions and groundings on fish and wildlife depriving the public and decision makers of important information. In light of this omission, no legitimate conclusion can be drawn that there would be no unavoidable significant impacts on fish and wildlife from vessel accidents.

The DEIS acknowledges that collisions and groundings can result in spillage of bunker fuel, 5.4-43, and that increase in vessel traffic associated with the project will increase the risk of vessel accidents and spills of bunker fuel. DEIS, 5.4-43 and 44. Despite recognizing that bunker fuel spills from vessel accidents can be severe in the marine environment and more difficult to clean up, DEIS 5.4-44 and 45, and would result in "potential toxic acute or subacute impacts that could affect the respiration, growth, or reproduction of the affected fish" 4.7-28, the Fish and Wildlife portion of the DEIS only considers the impacts of small (e.g., less than 50 gallons) spills of fuel on fish (but not on marine mammals) associated with bunkering. 4.7-28. A revised DEIS and Final EIS must include studies, analysis, and full disclosure of all vessel accident impacts including spillage of bunker fuel and spillage of coal cargo on fish and wildlife at the coal terminal and along the entire vessel transportation route including in the lower Columbia River, along Washington's and Alaska's coasts and in the states' coastal oceans including areas where fish and wildlife species are protected by National Wildlife Refuges.

C. <u>Impacts of Underwater Noise and Vessel Strikes on Marine Mammals</u>

Marine mammals, especially Ceteceans, depend on sound to communicate, find food, reproduce, detect predators and hazards, navigate, and sense their surroundings.

The increasing large commercial vessel traffic is also increasing the amount of human-produced ocean sound that functions as noise for marine mammals. Large commercial vessels, including the large bulk carriers, including the 1680 incoming and outgoing vessels that would be used by MBTL for its shipments to Asia, produce loud and predominantly low frequency sounds. Sounds can emanate from ships' propellers, machinery, hull passage through the water, and the increasing use of sonar and depth sounders. Low-intensity sound, in particular, can travel over great distances and encompass a large area of impact. These noises may be heard over millions of square kilometers of the ocean not only in the Columbia River near the project, but all along the vessel route to Asia. Some results of noise impacts on marine mammals include: stress; hearing damage; strandings; displacement from critical feeding and breeding grounds; avoidance and shifts in migration paths; and changes in vocalizations (including decrease), respiration, swim speed, diving, and foraging behavior. Weilgart, L.S. 2007. A Brief Review of Known Effects of Noise on Marine Mammals. International Journal of Comparative Psychology. 20, 159-168. Available from: http://www.comparativepsychology.org/ijcp-vol20-2-3-2007/07.Weilgart_PDF.pdf.

The DEIS acknowledges that the increase in deep draft vessels traffic can result in adverse impacts from large vessel underwater noise (DEIS, 5.4-45). It also acknowledges that there is a greater incidence of vessel strikes with whales than other marine mammals. DEIS 4.8.-24. But the study area (the same for direct and indirect impacts for large vessel noise impacts and vessel strikes on marine mammals, Wildlife Report, 1.3) is artificially limited to "the main channel of the Columbia River and extends approximately 5.1 miles upstream and 2.1 miles downstream in the Columbia River, measured respectively, from the upstream and downstream extents of the proposed docks (Docks 2 and 3) at the project area." SEPA Wildlife Technical Report (Wildlife Report) 1.3.1.2.and Figure 4. As a result, the only order of marine mammal for which vessel noise impacts and vessel were considered is pinnipeds including three species found in the lower Columbia River that swim through the study site. DEIS 4.8.3.3; 4.8.4; Wildlife Report, 3.1.1.4. The DEIS basically concludes that these sea lion and seal species will probably just get used to the additional vessel noise and probably get out of the way of the project's 1680 massive bulkers. DEIS 4.8-24 and 4.8-25; Wildlife Report 3-23 and 3-21. These conclusions may be questionable in themselves: they are based on speculation ("…it is *likely* that an individual would have the ability to avoid and swim away from the vessel." "Any response to project-related vessel noise would *likely* be minimal." Emphasis added). The cumulative impacts analysis adds nothing to the discussion because it merely repeats these speculative conclusions without any real analysis of the cumulative impacts of noise and vessel strikes from the project vessels in isolation and when added to other reasonably foreseeable vessel transportation projects. DEIS 6-33.

The DEIS omits studies, analysis and disclosure of increased vessel noise and vessel strike impacts on Cetaceans and other marine mammals along the vessel route outside the constricted study area in Washington and Alaska's coastal oceans and along the states' coastlines. The DEIS fails to contain this analysis despite the fact that Washington's iconic endangered Southern Resident Orcas feed outside the mouth of the Columbia River and along the coast to the north and south of the River as do Humpback and other whales. Unless the project's vessels plan to cut their engines and other noise generating equipment just outside the MBTL terminal, a revised DEIS and Final DEIS must include the significant and unavoidable impacts of vessel noise and marine mammal strikes all along the vessel route. The agencies must study, analyze and fully disclose the impacts on Orca whales and all other Cetaceans and other marine mammals all along the vessel route outside the artificially drawn study area before the DEIS could reasonably conclude there would be no unavoidable significant impacts on marine mammals from vessel transportation-related noise and strikes.

D. <u>Impacts on Fish from Wake Stranding</u>

Wake stranding of fish from the increased number of deep-draft vessels for the project is a significant adverse impact. Wake stranding kills and injures fish because vessel wake lifts them onto the shoreline. Among other things, the fish in the lower Columbia River sustain marine birds and mammals, including Washington's Southern Resident Orca whales. The DEIS acknowledges that the increase in vessel traffic from the project would contribute to wake standing of fish, DEIS 4.7-32, and that a growing body of evidence "that juvenile salmon and other fish are at risk of stranding on wide, gently sloping beaches because of wakes generated by deep draft vessel passage ," DEIS 4.7-18 and 4.7-31; SEPA Fish Technical Report (Fish Report) 2.2.2.7 and 3-23. The DEIS concludes that "Subyearling Chinook salmon appear to be more susceptible to stranding, accounting for approximately 80% of the fish stranded by vessel wakes along the lower Columbia River." DEIS 4.7-31, Fish Report 3-25 (the studies cited in the report demonstrate this is more significant than an "appearance").

According to the DEIS, project vessels (which the DEIS numbers at 840 but that is only the number of vessels traveling one way, the actual number would be 1680) would "introduce additional permanent risk of fish stranding in the Columbia River." DEIS 4.7-18. The DEIS fails to analyze how many juvenile Chinook salmon would be stranded annually. There is no real analysis of whether or why this impact might be or not be entirely avoided except the DEIS says slowing vessels "*could*" reduce wake at Barlow Point. DEIS 4.7-19. No mitigation measure identified in the DEIS addresses wake stranding. DEIS 4.7.7. There is no quantitative cumulative impacts analysis of repeated wake stranding of juvenile Chinook salmon and other fish from the cumulative project vessel traffic in isolation or in the context of increasing cumulative vessel traffic

in the Columbia River. How many fish would be stranded and how would this impact the overall population of Chinook salmon and the marine birds and mammals that depend upon this food source? The DEIS, 6-31 and 32, merely concludes that increased vessel traffic associated with the cumulative projects could increase the potential for fish stranding caused by vessel wakes. Nevertheless, the DEIS erroneously concludes with regard to all impacts on fish including wake stranding "[c]ompliance with laws and implementation of voluntary measures and mitigation measures described above would reduce impacts on fish. There would be no unavoidable and significant adverse impact." DEIS 4.7.8. This conclusion is without basis with regard to wake stranding, particularly in light of the omissions in the analysis. A revised DEIS and the Final EIS must study, analyze, and fully disclose the impacts on fish of wake stranding over the life of the project and must identify effective mitigation. Moreover, impacts of fish wake stranding on marine birds and marine mammals that depend on live fish as their food source (including affected birds and mammals outside the narrow study area) must be included in a revised analysis.

E. Impacts of Releases of Non-native or Invasive Species in Ballast Water or from Ship Fouling

Significant adverse impacts result from the introduction of invasive aquatic species into the marine environment including competition for food with indigenous fish, shellfish, and birds. Some invasive marine species could irreparably and permanently alter the invaded marine ecosystem. The coastal areas of Alaska are already experiencing the effects of invasions by aquatic species. These species are most commonly introduced through ballast water exchange, although ballast water may also be released during an accident or other emergency event. Alien aquatic species are also released from fouled hulls or other vessel structures and equipment.

The DEIS inappropriately avoids any analysis of releases of non-native or invasive species in ballast water or from ship fouling and does not provide mitigation for this impact by merely referencing U.S. Coast Guard and Washington State regulations. There is no discussion of what these regulations would require of vessels calling on MBTL or whether and how effective those regulations would be in controlling invasive species for the vessels that would be calling on MBTL from foreign ports. Compliance with existing regulations cannot be used as mitigation. A revised DEIS and the Final EIS must correct this flaw.

V. CUMULATIVE IMPACTS

The DEIS acknowledges that cumulative impacts "can result from individually minor but collectively significant actions that occur over time." DEIS 6.1. Thus, a careful analysis of cumulative impacts can reveal new significant and unavoidable

impacts of MBTL's proposed project when added to all past, present and reasonably foreseeable future actions even if construction and operation of MBTL's project alone would not result in significant and unavoidable impacts. "The purpose of the cumulative impacts analysis is to ensure that decision-makers consider the full range of consequences for the Proposed Action, including the Proposed Action's incremental contribution to cumulative impacts on the environment." Unfortunately, the cumulative impacts chapter in the DEIS does not provide enough information or analysis with which decision makers can assess the full range of consequences of their actions. Indeed, Chapter 6 fails of its stated purpose: to address how the cumulative increases in, for example, vessel transportation, would *actually impact* fish and wildlife. As one example, the DEIS concludes that the risk of large and small bunker fuel oil spills from vessels would increase 6-58. This is an obvious conclusion from cumulative increases in vessel traffic, but the DEIS does not address the consequences of cumulative oil spills or resulting impacts on fish and aquatic wildlife and fisheries resources of increasing oil spills. As noted in section IV.D. above, there is no quantitative cumulative impacts analysis of repeated wake stranding of juvenile Chinook salmon and other fish and no indication whether the cumulative vessel transportation from either the project's vessels in isolation or combined with all cumulative vessel traffic would result in wake stranding becoming a significant unavoidable impact . See DEIS 6-31 and 32. Little additional information has been generated or disclosed in DEIS Chapter 6 beyond what has already been presented in earlier chapters and there is no discussion of whether any cumulative impact on any fish or wildlife species would create an unavoidable impact to that resource.

Like resource study areas, cumulative impacts study areas are artificially constrained in the DEIS and the DEIS fails to fully disclose the cumulative risks and consequences of oil and coal spillage for fish and wildlife, including fish and wildlife protected by National Wildlife Refuges in Washington and Alaska, cumulative noise and vessel strike impacts on Ceteceans and other marine mammals (other than pinnipeds in the Columbia River near the project area), cumulative impacts of releases non-native and invasive species outside the study area, etc. Chapter 6 also fails to include all projects that could result in cumulative impacts from increased vessels along the vessel route. As one example, the Kinder Morgan Trans Mountain Expansion (tar sands diluted bitumen export) project recently approved by the Canada Energy Board would result in a sevenfold increase in oil tankers transiting along Washington's and Alaska's oceans and coastlines and along the North Pacific Great Circle Route (including through the Aleutian Islands) to Asia. Additionally, after failing to develop quantitative and qualitative studies of cumulative impacts of increased vessel traffic on fish and marine mammal species, the DEIS makes the following unacceptably vague and speculative statement that mitigation measures "similar" to those in Chapter 4 "[I]t is likely that

similar measures would be implemented for the cumulative projects, thus reducing the potential impacts in similar ways." DEIS, 6-33.

The cumulative impacts of the project's operation on fish and wildlife resources, including species along the vessel route outside the limited study areas and species protected by Washington and Alaska's National Wildlife Refuges must be studied, analyzed and disclosed in a revised DEIS and the Final EIS. Consequences on fish and wildlife from increasing vessel traffic impacts must be included. Cumulative impacts of the project's operation in isolation and when combined with other actions must be included. In the absence of this information, decision makers cannot make a fully informed decision.

VI CONCLUSION

The DEIS identified significant and unavoidable adverse impacts from construction and operation of the proposed project on the following nine resource areas that would not be eliminated even if mitigated: greenhouse gas emissions, vessel transportation, tribal resources, social and community resources, cultural resources, rail transportation, rail safety, vehicle transportation, and noise and vibration. The DEIS's finding of "significant and unavoidable adverse impact" for any *one* of these resource areas mandates selection of the No Action Alternative. Nevertheless, the DEIS is deficient in important respects that we have set forth above. The DEIS failed to include studies, analysis, and full disclosure of impacts not only on the narrowly defined study areas, but also importantly on Washington and Alaska's coastal oceans, coastlines, fish and wildlife and economies dependent on healthy National Wildlife Refuges. The omission of these impacts from the EIS deprives the public and the decision makers of complete information about significant environmental consequences of MBTL's proposed project. The DEIS's omissions and deficiencies are so significant that a revised DEIS must be issued to include impacts we have addressed and the Final EIS must also include these impacts.

Washington State is currently respected as a leader in the development of clean energy and fuel transportation policies. Approval of permits for this fossil fuel project on the foundation of this incomplete and flawed DEIS would sully this status and would be counter to the work the state has done to address greenhouse gas emissions that are contributing to severe changes to the climate and acidification of oceans. Among other things, in light of the present climate crisis, it is inconceivable that agency decision makers would fail to perform their duties as trustees of the Public Trust protecting the air, atmosphere, water, wildlife, communities, and economies in this matter. They must choose the No Action Alternative and deny permits for the project.

Respectfully submitted by,

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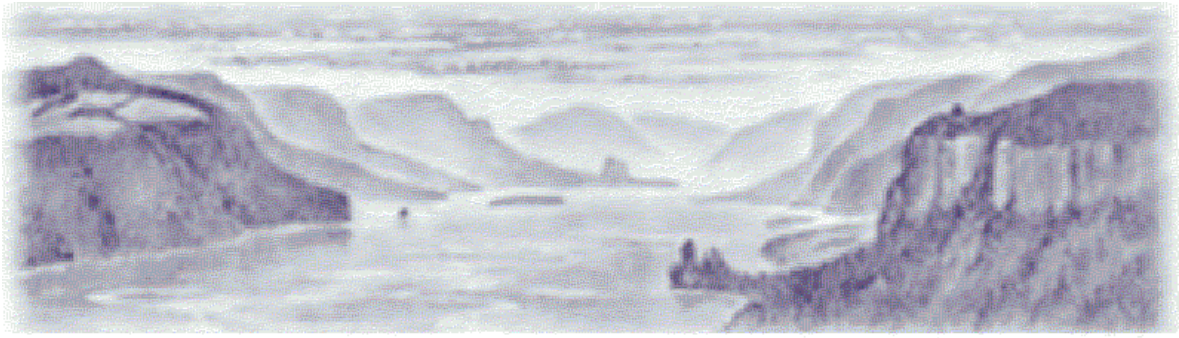

FRIENDS OF THE COLUMBIA GORGE

SUBMITTED VIA WEB PORTAL

June 13, 2016

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Re: Friends of the Columbia Gorge Comments on Draft Environmental Impact Statement for the Millennium Bulk Terminals Longview DEIS

Dear SEPA Responsible Officials:

Friends of the Columbia Gorge (Friends) submits the following comments on the Millennium Bulk Terminals Longview (MBTL) coal export terminal DEIS to supplement the coalition comments filed on our behalf by Earthjustice. Friends is a non-profit organization with approximately 6,000 members dedicated to protecting and enhancing the resources of the Columbia River Gorge. Friends' membership lives, works, and plays in the Columbia River Gorge and would be adversely affected by the direct, indirect, and cumulative impacts caused by MBTL coal export terminal.

The proposed MBTL coal export terminal would cause a significant increase in the number of unit trains of coal passing through the Columbia River Gorge. The direct, indirect, and cumulative impacts of the addition coal train traffic would cause significant adverse impacts to communities in the Gorge and the scenic, natural, cultural, and recreation resources of the Columbia River Gorge National Scenic Area. This ultimate conclusion is supported by the DEIS, which identifies a range of unavoidable significant adverse impacts. However, the DEIS fails to disclose the full extent of impacts, particularly impacts to the communities and resources in the

Columbia River Gorge. It also fails to provide mitigation for some of them. Friends recommends that the EIS be revised to fully disclose and mitigate the impacts to the Columbia River Gorge.

1. The Columbia River Gorge is a national treasure.

The Columbia River Gorge is a national treasure. In 1986 Congress recognized the national significance of the Gorge and created the Columbia River Gorge National Scenic Area to protect and enhance the aesthetic, biological, ecological, historic, and recreational values in the Gorge. *See* Columbia River Gorge National Scenic Area Act, 16 U.S.C. §§ 544–544p.[1] The Gorge, under the protection of the Scenic Area Act, offers a stunning array of sensitive resources, including scenic and historic views along the Columbia River, site of the final portion of Lewis and Clark's journey across the West. The Gorge has been occupied by Native American tribes for more than 10,000 years, and the scenic, natural, and cultural resources of the Gorge remain critical to sovereign Native American governments.

Additionally, the Gorge offers unique recreational opportunities with its many side-river canyons, ridgetops, and the Columbia River itself. Hiking, bicycling, longboarding, river rafting, kayaking, skiing, boating, fishing, camping, kiteboarding, windsurfing, paragliding, birdwatching, and wildflower viewing are all pursued actively by the public throughout the Gorge. The Columbia River itself is a world-renowned windsurfing and kiteboarding destination that is contingent on public access across rail lines to high-quality recreation sites on the Columbia River. The Gorge also has a growing agri-tourism industry centered on the local vineyards and wineries that form the Columbia Gorge American Viticultural Area (AVA). Many of the vineyards and wineries are in close proximity to the rail lines in the Gorge.

The Columbia River Gorge National Scenic Area is particularly rich in natural resources due to a diverse collection of ecosystems and micro-habitats. The Columbia River Gorge is home to 800 species of flowering plants, including 15 species of wildflowers that exist nowhere else in the world. The Gorge has 44 species of fish, including several species of salmon listed under the federal Endangered Species Act, and 200 species of birds.

The National Scenic Area is also a working landscape, sustained economically by agricultural and forest lands and 13 designated urban areas. The urban areas in the National Scenic Area are generally located along the Columbia River and straddle the highway and railroad transportation corridors than run the length of the Gorge in both Washington and Oregon.

In its November/December 2009 issue, *National Geographic Traveler* ranked the Columbia Gorge region sixth internationally, and second in the nation, among "iconic destinations."[2] The Gorge was ranked higher than all of the county's national parks that were surveyed, and higher than Tuscany, Italy; the Serengeti Plains; and Mount Kilimanjaro. A primary reason given by *National Geographic* for the Gorge's high ranking was the Gorge's international reputation for

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[1] A copy of the National Scenic Area Act and Management Plan have been attached for reference.
[2] See Council Order No. 868, Whistling Ridge Final Adjudicative Order, Concurring Opinion of Chairman James Luce at 45, fn iii (Luce references the National Geographic ranking and explains that "the Gorge is recognized as an environmental wonder.").

"an incredible job of protecting the views." Another stated reason was the Gorge's "[g]reat potential for 'agritourism and geotourism.'"

The Gorge has long been considered a special area. In 1915, the U.S. Forest Service ("USFS" or "Forest Service") established the Columbia Gorge Park as the first Forest Service Recreation Area in the nation. The following year, the Gorge was proposed as a National Park. Continuing development pressures led to the establishment of the National Scenic Area in 1986. Congress created the Columbia River Gorge National Scenic Area to protect the scenic, natural, cultural, and recreational resources of the Columbia River Gorge. The Columbia River Gorge National Scenic Area extends approximately 85 miles along the Columbia River Gorge.

Today the Gorge contains hundreds of miles of hiking and biking trails through locales as diverse as misty river canyons and arid grassland plateaus. The Gorge also contains dozens of lakes, parks, campgrounds, and other recreational areas.

SEPA specifically requires analysis of impacts to designated sensitive areas. WAC 197-11-330(3)(e)(i).[3] In addition to the National Scenic Area being a sensitive area that must be addressed in the EIS, the Columbia River Gorge has a remarkable concentration of local, state, and federally designated parks, recreation areas, wild and scenic rivers, and historic trails. The following state and federally designated areas are located within or near the Scenic Area:

- The Lewis and Clark National Historic Trail
- The Oregon Pioneer National Historic Trail
- The Historic Columbia River Highway (designated as a National Historic District on the National Register of Historic Places, as well as a National Historic Landmark)
- The Ice Age Floods National Geological Trail
- The White Salmon and Klickitat Wild and Scenic Rivers in Washington
- The Deschutes, Hood, and Sandy Rivers in Oregon
- Numerous "in lieu" and treaty fishing access sites
- Numerous state and local parks
- Hundreds of miles of hiking trails on federal, state, local, and private lands
- Three National Wildlife Refuges (Steigerwald, Franz Lake, and Pierce).

The proposed MBTL coal export terminal would accept an average of eight unit coal trains per day. DEIS at 5.0-3. The facility would generate an additional 2,920 fully loaded coal trains through the Columbia River Gorge per year. The major increase in rail traffic would pass through multiple sensitive locations in the Gorge, including the following:

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[3] *Swift v. Island County*, 87 Wn. 2d 348, 552 P.2d 175 (1976) established the importance of addressing impacts to sensitive areas near a project proposal and the importance of taking expert agency comments into consideration during SEPA review. In *Swift* the court ruled that a county's determination of non-significance violated SEPA because its findings conflicted with the comments of other agencies and experts regarding impacts to sensitive areas. The agencies and experts included the United States Department of the Interior, Fish and Wildlife Service; State Parks and Recreation Commission; State Department of Game; State Department of Ecology; the Central Whidbey Island Historic Preservation Advisory Committee, and an authority on birds. *Id*. at 355.

- Nine designated urban areas where populations are concentrated in proximity to the BNSF rail line: North Bonneville, Stevenson, Carson, Home Valley, White Salmon, Bingen, Lyle, Dallesport, and Wishram.
- If the Union Pacific line is utilized, four designated urban areas in Oregon: The Dalles, Mosier, Hood River, and Cascade Locks.
- Numerous popular recreation sites, including Columbia Hills State Park, Doug's Beach State Park, Klickitat-Balfour Day Use Area, Spring Creek Hatchery State Park, Drano Lake Boat Launch, Home Valley Park, Wind River Boat Launch, and Beacon Rock State Park.
- Numerous sensitive riverine habitats, including the mainstem Columbia River and major tributaries such as the Klickitat River, the White Salmon River, the Little White Salmon River, and Wind River.
- Numerous sensitive wildlife sites, including three National Wildlife Refuges: Steigerwald NWF, Franz Lake NWF, and Pierce NWF.

The proposed facility would cause significant adverse impacts to these areas. First, the substantial increase in coal by rail would create a unacceptable risk of a major derailment and spill. Such an accident would be harmful to residents in the Gorge and to the scenic, natural, cultural, and recreation resources of the Gorge. Second, the substantial increase in rail traffic would cause significant adverse impacts from increased delays at railroad crossings, increased noise, and increased air pollution. The increased rail traffic would also likely contribute to the need for additional railroad construction in the Gorge.

The Columbia River Gorge National Scenic Area (CRGNSA) was established for two purposes: "to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources" of the CRGNSA and, consistent with such resource protection, "[t]o protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas. . . ." 16 USC § 544a. This is reflected in the Management Plan for the Columbia River Gorge National Scenic Area. It allows more intensive development in designated urban areas while strictly protecting the Gorge outside of urban areas. Development outside of urban areas must be met with higher scrutiny.

The CRGNSA outside of urban areas is further divided into the General Management Area (GMA) and the Special Management Areas (SMAs). The boundaries of the SMAs were defined by Congress and include many of the most critical areas for conservation. 16 USC § 544b(b). GMA lands have significant protections for scenic, cultural, recreational, and natural resources while SMA lands are given an even higher level of protection.

To protect the scenic resources of the NSA, Key Viewing Areas ("KVAs") have been designated. Development visible from KVAs is highly regulated in both the GMA and the SMAs and can result in permit denial or require mitigation. KVAs are a bedrock principle of the CRGNSA Act and they have resulted in significant protection for the scenic resources of the Gorge. The Management Plan also includes detailed provisions for protecting the cultural, recreational, and natural resources of the CRGNSA.

RCW 43.97.025(1) also applies to the review of this project: "all state agencies and counties are hereby directed and provided authority to carry out their respective functions and responsibilities in accordance with the [Columbia River Gorge Compact], the Columbia River Gorge National Scenic Area Act, and the provisions of" the Gorge Management Plan and state implementation of the Act. As such, Ecology and the County are **required** to take into account all impacts to the National Scenic Area and to ensure that decisions are consistent with all National Scenic Area authorities.

2. The DEIS is flawed, but nonetheless concludes that there would be significant, unavoidable impacts.

The DEIS has many flaws. For example, the DEIS under-inclusively examined rail impacts stemming from transporting coal from the Washington border to Longview. The coal would originate in the Powder River Basin in Montana or Wyoming or in the Uinta Basin in Utah. DEIS at 5.1-7. Transporting the coal to the Washington border was not examined. Eliminating a large part of the trip does not provide the full disclosure required by SEPA. WAC 197-11-060(4)(b). Despite this omission and the significant errors identified below, the DEIS does provide the basis to deny the application. The DEIS identifies "unavoidable and significant adverse impacts" that would occur in the Gorge even after mitigation measures are applied. DEIS at S-53–S-58. Table S-2 summarizes the unavoidable and significant adverse impacts, including the following examples of impacts to the NSA:

- Adverse impacts to treaty fishing rights;
- Increased delay at railroad crossings;
- Rail traffic would cause tracks to exceed capacity (presumably resulting in new construction of railroad sidings, double-tracks, and overpasses); and
- Increased emissions of greenhouse gasses (which would further affect, for example, air quality, habitat, and recreation).

Based on these disclosures, the County and the Department of Ecology (Ecology) have the necessary basis to reject the proposal. Once the EIS is revised to include all of the omitted impacts, the project should be denied.

3. The EIS should be revised to provide adequate disclosure of the risk of derailments and coal spills and the consequences of all types of train incidents on Gorge communities and resources.

The EIS estimates 2.59 extra train accidents per year between Pasco and Vancouver on the Washington side of the border due to the proposed MBTL coal export terminal. DEIS at 5.2-8. Accident occurrence in the DEIS was not adjusted based upon increased coal dust emissions caused by the proposed project. DEIS at 5.2-4. However, "BNSF has determined that coal dust poses a serious threat to the stability of the track structure and the operational integrity of" its railroad network.[4] Coal dust emitted from train cars gets into the rock ballast that supports the railroad ties, making the track unstable and more susceptible to damage.

[4] Available at http://www.bnsf.com/customers/what-can-i-ship/coal/coal-dust.html.

Photo of coal dust fouling the air at Columbia Hills State Park in the Columbia River Gorge National Scenic Area. Photo taken on May 22, 2015. Provided by Friends of the Columbia Gorge.

In fact, BNSF has attributed derailments to ballast contaminated with coal dust.[5] While the DEIS acknowledges that coal dust causes additional safety issues, it does not take this into account and simply calculates the additional number of accidents based upon the extra trains that would run on the tracks. DEIS at 5.7-15, DEIS at 5.2-4. The extra derailments due to damage to railroad ballast caused by fugitive coal dust emissions must be considered in the calculation of rail accidents caused by the proposed project. Additionally, as heavier trains result in more damage to tracks, the weight of coal trains must be considered in the rail accident calculations.

Some examples of recent incidents illustrate the risks of derailment. Each of these incidents involved a coal train, was caused by damage to rail infrastructure done by coal trains, occurred in the Gorge NSA, or threatened federally protected resources of the Columbia River Gorge NSA:

- In July 2012 a coal train transporting Powder River Basin coal derailed near Pasco, Washington, dumping an undetermined amount of coal.[6]

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[5] *See* Decision, March 3, 2011, Arkansas Electric Cooperative Association—Petition for Declaratory Order, Surface Transportation Board, Docket No. FD 35305, at 7.
[6] The Seattle Times, *Coal train derails in Columbia River Gorge*, (July 2, 2012) (Attached). Available at http://seattletimes.com/html/localnews/2018585778_apwacoaltrainderailment.html (last visited Jan. 14,

- In July 2012 a coal train derailed in Chicago because a bridge was not designed to carry the weight of coal cars.[7]
- On April 24, 2005, an Amtrak train traveling on the Washington side of the Columbia River derailed within the National Scenic Area.[8]
- In January 2003, a train containing hazardous waste derailed near The Dalles on the Oregon side of the Columbia River. That derailment occurred in a culturally significant area within the Columbia Gorge National Scenic Area, and threatened tribal cultural resources.[9]

Large amounts of accumulated coal debris on the ground adjacent to the BNSF right-of-way at Columbia Hill State Park in the Columbia River Gorge National Scenic Area. Photo by Michael Lang, May 17, 2016, 16 months after the Pasco re-spray facility became operational.

Additionally, the DEIS does not consider the adverse effects on Gorge resources of the contents of the cars that would be spilled. As discussed in Sections 5 and 6 below, coal dust and debris are dangerous substances. The effects of cargo spill on the Gorge environment needs to be fully

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2013).Tri City Herald, *Coal Train Derailment* (July 3, 2012) (downloaded Jan. 14, 2013). Available at http://www.tri-cityherald.com/2012/07/03/2009115/coal-train derailment.html#wgt=rcntmulti#storylink=cpy (last checked Jan. 14, 2013).

[7] Chicago Tribune, *2 bodies inside car found in wreckage from train derailment*, (July 5, 2012) (Attached). Available at http://articles.chicagotribune.com/2012-07-05/news/ct-met-train-derailment-overpass-20120705_1_train-derailment-coal-cars-bridge-collapse. (last visited Jan. 14, 2013).

[8] The Seattle Times, *26 Hurt When Amtrak Train Derails Along Columbia Gorge Route*, (April 4, 2005) (Attached). Available at http://seattletimes.nwsource.com/html/localnews/2002230033 _derail04.html (last visited January 14, 2013).

[9] U.S. E.P.A., Making Environmental Progress, Improving Local Communities Accomplishments of the EPA Region 10 Superfund Program (Jan. 2004) (Excerpt attached).

taken into account. The final EIS should disclose the actual worst-case risks and provide adequate disclosure of the consequences on the people and the protected resources of the Gorge.

Bakken crude oil train exploding after derailing in Mosier Oregon in the Columbia River Gorge on June 3, 2016. Photo by KGW Television.

The DEIS also does not consider the adverse environmental effects of increased train accidents spilling other commodities besides coal. BNSF acknowledges that coal dust gets into the rail ballast and damages the track infrastructure and that this damage has eventually resulted in derailments.[10] BNSF and Union Pacific carry various hazardous materials over their rail networks, including Bakken crude oil. Of course, the elephant in the room is the June 3, 2016 derailment of a Union Pacific Bakken crude oil train in Mosier Oregon in the Columbia River Gorge. The weight of crude oil trains makes them more susceptible to derailment than are other trains when rail infrastructure is previously damaged.[11] Coal dust damages rail infrastructure. The increased coal dust emissions as a result of the proposed action would result in more incidents involving trains carrying Bakken crude oil. When Bakken crude oil trains derail they inevitably break open, leak, and explode. That is exactly what happened in Mosier. All of the

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[10] *See* http://www.bnsf.com/customers/what-can-i-ship/coal/coal-dust.html. *See also* Decision, March 3, 2011, Arkansas Electric Cooperative Association—Petition for Declaratory Order, Surface Transportation Board, Docket No. FD 35305, at 7.

[11] "Petroleum crude oil unit trains with heavily loaded tank cars will tend to impart higher-than-usual forces to the track infrastructure during their operation. These higher forces expose any weaknesses that may be present in the track structure, making the track more susceptible to failure." Transportation Safety Board of Canada, RAIL SAFETY ADVISORY LETTER – 04/15, *available at* http://www.tsb.gc.ca/eng/medias-media/sur-safe/letter/rail/2015/r15h0021/r15h0021-617-04-15.asp

potential significant adverse effects that would occur from an oil train crashing in the Gorge due to fouled railroad ballast from coal dust emissions due to the MBTL coal terminal must be taken into account in the EIS.

Explosive fire in Mosier caused by a Bakken crude oil train derailment. The large white building is the Mosier K-12 school that was filled with children at the time of the crash. The building would have been "incinerated" if the normally prevailing winds were blowing on that day according to Mosier Fire Chief Ron Appleton. Photo by Paloma Ayala.

The increased chances of a Bakken crude oil spill and explosion due to the fouling of the railroad ballast by fugitive coal dust emissions must be disclosed, analyzed, and mitigated in the EIS. The effects on human lives as well as the effects on the scenic, cultural, recreational, and natural[12] resources of the Gorge NSA must be included.

The DEIS also ignores any possibility of train incidents occurring in the Gorge in Oregon due to the increased train traffic that the proposed action would bring. Union Pacific, which operates the tracks on the South side of the Columbia River, has an even worse safety record than BNSF. Impacts in Oregon cannot be lawfully ignored. WAC 197-11-060(4)(b). The increased incidence of accidents in Oregon that would result from building the coal terminal in Longview must also be disclosed and mitigated in the EIS.

[12] This should include an analysis of the effects of spills of oil and any other hazardous materials carried by rail through the Gorge on the Columbia River.

4. The EIS must be revised to fully disclose impacts of coal dust on air quality in the Gorge.

Increased coal train traffic would cause an increase in air pollution in the Gorge, this includes fugitive emissions of coal dust and diesel emissions from trains. The DEIS does not appear to consider the impacts of the locomotive-related diesel emission that would be generated as a result of the proposed project. This major omission must be rectified in the final EIS. The DEIS does acknowledge air quality impacts from fugitive emissions of coal dust, but ultimately fails to provide adequate disclosure of the actual impacts. DEIS at 5.7-1. The EIS must be revised to disclose indirect and cumulative impacts of the proposal on Gorge air quality. All impacts on air quality in the Gorge must be disclosed, analyzed and mitigated in the final EIS. This analysis must be informed by the substantial amount of existing information about Gorge air quality.

The Columbia River Gorge National Scenic Area is already severely impaired by air pollution, especially nitrogen oxides (NOx) and particulate pollution. The Gorge now stands among the most polluted places in the country, including Pittsburgh and Los Angeles. A 2005 joint study by the U.S. Forest Service and National Park Service studied twelve federally managed areas around the West and found that the Columbia River Gorge National Scenic Area and Sequoia National Park had by far the worst "annual standard visual range[s]" of the twelve areas.[13] Similarly, a 2000 Forest Service study of air quality monitoring data from 39 federally managed "visibility protected" areas in the West found that the Scenic Area has "the highest levels of haze" and "the sixth worst visibility pollution of these areas."[14] Gorge air quality has been monitored for the last twenty years. The Forest Service has documented that visibility impairment occurs on at least 95% of the days that have been monitored.[15]

Deposition of pollutants also has profound negative impacts on ecosystems. Studies demonstrate that in the Western United States, some aquatic and terrestrial plant and microbial communities are significantly altered by nitrogen deposition.[16] Metals, sulfur, and nitrogen concentrations in lichen tissue found in the Gorge are comparable to that found in lichen tissue sampled in urban areas. Nitrogen deposition rates in the Gorge are comparable to the most polluted areas in the United States.

Particulate matter pollution also threatens human health and welfare. In fact, when reviewing the National Ambient Air Quality Standards for PM2.5, the EPA found that there is no level of particulate matter pollution at which there are no human health effects. According to the EPA, fine particulate matter pollution causes a variety of adverse health effects, including premature

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[13] Mark Fenn, USDA Forest Service et al., *Why federal land managers in the Northwest are concerned about nitrogen emissions*, at 10 (Dec. 2004).
[14] Arthur Carroll, USDA Forest Service, Letter to Columbia River Gorge Commission, at 3 & attach. 3 (Feb. 7, 2000).
[15] Robert Bachman, USDA Forest Service, *A summary of recent information from several sources indicating significant increases in nitrogen in the form of ammonia and ammonium nitrate in the Eastern Columbia River Gorge and the Columbia Basin*, at 2 (June 24, 2005).
[16] *See* Mark E. Fenn, et al, Ecological Effects of Nitrogen Deposition in the Western United States, BioScience Vol. 53:4, Apr. 2003, available at http://www.bioone.org/doi/abs/

death, heart attacks, strokes, birth defects, and asthma attacks.[17] Even low levels of PM can cause low birth weights, damage lung function, and increase risks of heart attack and premature death. Studies reviewed by EPA revealed a linear or almost linear relationship between diseases like cancer and the amount of fine particulate matter in the ambient air.[18] Consequently, particulate matter contamination has adverse health effects at any concentration.

The Management Plan for the National Scenic Area requires that "air quality shall be protected and enhanced, consistent with the purposes of the Scenic Area Act." NSA Management Plan at I-3-32–33. Pursuant to this requirement, the Gorge Commission approved the *Columbia River Gorge Air Study and Strategy* (Sept. 2011). It summarizes the existing science on air quality impacts, adopts thresholds for significant impacts to visibility, and adopts an overall goal of "continued improvement" in visibility in the National Scenic Area.[19] In addition, guidance documents prepared by Federal Land Managers provide methodologies and thresholds for evaluating air pollution impacts to sensitive federal lands in both Class I and Class II areas.[20] The Forest Service has been monitoring lichen and air quality monitoring throughout the National Scenic Area.[21] The EIS should be revised to incorporate this information on existing air quality and the potential impacts from additional contributors to nitrogen deposition. These resources provide a scientific and policy foundation for Ecology to evaluate air pollution impacts to the Columbia River Gorge.

Since thresholds for significant adverse impacts have already been exceeded for particulate matter and nitrogen deposition, any significant additional source of pollutants will likely contribute to cumulative significant adverse impacts to Gorge resources.

Open-top coal trains lose huge volumes of coal dust and debris during transportation. Even after the re-spray facility opened in Pasco, the picture below demonstrates the occurrence of a massive coal dust emission from a typical coal train in the Gorge. According to Burlington Northern Santa Fe ("BNSF") studies, between 500 lbs. and 2000 lbs. of coal can be lost in the form of dust from each rail car.[22] In other studies, as much as three percent of the coal in each car (around 3600 pounds per car) can be lost in the form of dust. A study of a West Virginia rail line found that one pound of coal per car per mile is lost from coal trains.[23] At this rate, one coal train with 120 cars traveling 85 miles through the Columbia River Gorge National Scenic Area could lose

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[17] 71 Fed. Reg. 2620, 2627–36 (Jan. 17, 2006).
[18] *Id*.
[19] The *Columbia River Gorge Air Study and Strategy* and appendices are available at http://www.deq.state.or.us/aq/gorgeair/.
[20] The Federal Land Managers have adopted the following guidance documents that can be used to evaluate air pollution impacts to the Columbia River Gorge: *Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase 1 Report—Revised* (2010) and *Federal Land Mangers' Interagency Guidance for Nitrogen and Sulfur Deposition Analyses* (2011). These reports are available at http://www.nature.nps.gov/air/permits/flag/.
[21] The Forest Service maintains a database of all lichen/air quality monitoring sites at http://gis.nacse.org/lichenair/index.php?page=query&type=community.
[22] See Hearing, July 29, 2010, Arkansas Electric Cooperative Association—Petition for Declaratory Order, Surface Transportation Board, Docket No. FD 35305, at 42: 5-13.
[23] Simpson Weather Associates 1993. Norfolk southern rail emission study: consulting report prepared for Norfolk Southern Corporation. Charlottesville, VA.

just over 10,000 pounds of coal in the Gorge. One coal train per day for 365 days is 3,650,000 lbs. per year deposited on Gorge lands and in Gorge waterways.

Photo of an open-top coal train emitting large quantities of coal dust at Columbia Hills State Park in the Columbia River Gorge National Scenic Area. Photo taken on May 22, 2015 five months after the Pasco re-spray facility became operational. Provided by Friends of the Columbia Gorge.

Section 5.7 of the DEIS analyzes the effects of fugitive coal dust emissions from the proposed new coal trains. Much of the analysis in Section 5.7 is lifted directly from another DEIS prepared for the Tongue River Railroad Company. That DEIS never went through a complete review because the proponents abandoned the project before the EIS process was finished. The Tongue River DEIS was incomplete and inaccurate on coal dust issues and those problems have infected the MBTL DEIS. Copying large parts of a DEIS that was never completed, but that had received a significant amount of critical comments, was a mistake. We have enclosed one set of comments on the Tongue River DEIS as an example of expert comments that refute its draft findings. Section 5.7 needs to be reworked from scratch by the responsible officials to eliminate the bias and inaccuracies found in the Tongue River DEIS.

Section 5.7 appears to rely too much on industry assertions that topper agents, like those applied at the Pasco re-spray facility, are 85% effective in controlling coal dust emissions from open-top coal train cars. However, the analysis does not take into account the safe harbor to the 85% rule that allows unlimited emissions as long as certain practices are followed. Evidence from the field

indicates that shippers routinely take advantage of the safe harbor. Please see the attached *Coal Dust Pollution in the Columbia River Gorge National Scenic Area* for photographic evidence of the ineffectiveness of topper agents and load shaping in controlling coal dust emissions.

Section 5.7 also relies on a coal dust study that is inadequate for estimating the fugitive coal dust emissions that would come from new coal trains in the Gorge. The fact that the original study design was abandoned part way through calls the results into question. *Particulate Matter Measurements in Support of Assessing Coal Dust From Coal Hauling Trains* [henceforth Study] at 5-1. It is not clear from the study whether the errant data points were discarded or included as part of the study. Either the conclusions reached by the study were based partially upon data points that the party doing the study acknowledged were collected sub-optimally or the questionable data was discarded resulting in a study that had far fewer data points than designed. Either way, the study is simply inadequate.

Furthermore, during data collection for the study only one sample was taken when the wind was blowing at greater than 5 MPH. Study at 5-7. All other samples were taken when winds were below 5 MPH. *Id*. In the one sample that was taken when winds were greater than 5 MPH (the wind speed was 2.5 m/s or 5.6 MPH) the downwind concentration of coal-related PM 2.5 at 15 m was 26.09 $\mu g/m^3$ after netting out the upwind sample as an approximation of background conditions. *Id*. Samples taken when wind speeds were below 5 MPH typically showed much lower concentrations of coal-related PM 2.5. Study at A-2. Unfortunately, the study simply does not shed light on what the PM 2.5 concentrations would be in the Gorge when, as is typical, a strong wind is blowing. It does, however, raise a red flag that higher wind speeds result in higher coal-related concentrations of PM 2.5 being emitted from trains. The study, based entirely on low wind speed conditions of 5.6 MPH and below, simply does not provide a basis to conclude that the NAAQS levels will not be exceeded due to the additional eight coal trains that would traverse the Gorge per day if this proposal went forward.

The study itself acknowledges that it failed to adequately measure coal-related emissions in crosswind conditions.[24] Study at 5-1. Trains make sweeping turns in many locations in the Gorge – turns that expose the sides of the train cars to very high winds. More testing, at realistic Gorge wind speeds and aspects, needs to take place for the EIS to provide full disclosure of the potential effects of the proposal on air quality in the Gorge.

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[24] "The chosen location was picked for several reasons as described in Section 2, including that it appeared to offer the best possibility of cross-track winds, which review of available local meteorological data showed to consist of westerly winds (flowing west to east) for this time of the season. The samplers and deposition plates were laid out in a grid based on this assumption, with the majority of the measurements located on the east side of the tracks. However, winds with an easterly component were much more common during the study than anticipated based on available data, with only four of the 25 trains monitored occurring during winds with the expected westerly component. This impacted the goals in identifying gradients in deposition rates, and limited the usefulness of the DustTrak and MiniVol PM10 and PM2.5 data." Study at 5-1.

There are also other problems with Section 5.7 and the Study as identified by Dr. Dan Jaffe, Professor of Atmospheric Chemistry at the University of Washington Bothell and an expert on particulate matter emissions from trains.[25] These include:

- The railroad knew when the tests would be conducted so it could go above and beyond normal practice to skew the results of the study;
- The DEIS is based on the conclusion that the surfactant is always applied, is always applied correctly, and actually works when the test data show that coal dust is still emitted at a higher rate than would be supported by these assumptions;
- The DEIS assumes that any level of PM 2.5 below the NAAQS is acceptable when studies show that it is dangerous at levels below the NAAQS; and
- The modeling in the DEIS undercounts the amount of PM 2.5 from fugitive coal dust emissions by four-fold even if it were relying solely on the conclusions of the flawed study.

Consequently, Dr. Jaffe calls for the modeling to be redone assuming that the fugitive coal dust emissions will be 4 times higher than previously modeled to be consistent with the study. He also calls for an assumption in the modeling that the surfactant is misapplied or not applied 5% of the time to conform the model to observed conditions. We adopt these two recommendations and ask for updated modeling to be done.

The conclusions in Section 5.7 of the DEIS are also hard to square with the conclusions in Section 6.3.3.7. In the latter section, the air quality impacts of the project show an alarming 52.1% increase in 24-hour PM 2.5 and a 52.5% increase in annual PM 2.5 in the Gorge – bringing both levels dangerously close to their NAAQS thresholds. *Id*. Section 5.7 must be updated to reflect the cumulative effects of the proposed project or reworked so that it does not contain conclusions based erroneously on viewing one aspect of the project in isolation. If the modeling relied on an adequate study of the fugitive coal dust emissions of coal trains in realistic wind conditions in the Gorge, it is highly likely the modeling would show exceedance of NAAQS thresholds due to the cumulative effects of the extra proposed trains. This must be disclosed in the EIS.

The DEIS also fails to adequately consider the amount of coal dust spilled between the coal mine and the proposed terminal, the amount of coal dust spilled between the state border and the second surfactant spraying operation in Pasco and onward along the Columbia River to the proposed terminal. The DEIS assumes that the re-spray facility in Pasco, which became operational in early 2015, has deeply reduced coal dust emissions from rail transport, but this assumption is not backed by anecdote of by the coal dust study.

As discussed above, coal trains spill large amounts of dust. As seen in the photographs above, some of that coal dust is deposited adjacent to the tracks. Coal dust that has settled next to the tracks is disturbed by passing trains – whether unit coal trains or trains carrying other commodities. The effect on air quality in the Gorge due to the disturbance of coal dust is not

[25] See http://www.atmos.washington.edu/jaffegroup/modules/APOLLO/Comments%20on%20 Longview%20DEIS.pdf

even addressed in Section 5.7 of the DEIS. This is a fatal omission that must be corrected in the EIS.

Another issue missed by the DEIS is the effect of unloaded coal train on air quality. Unloaded coal trains may emit even more coal dust than loaded coal trains. For example, the Coal Train Pollution Signature Study that was conducted in Australia in 2013 concluded that there was "an average [ambient air particulate matter] increase of 18.8µg/m3 for full trains and 33.9µg/m3 for empty trains." This is not addressed in any way in the DEIS. The EIS must include an analysis of the air quality impacts of empty coal train cars and proper mitigation measures (e.g. cleaning empty train cars before they exit the project area) should be required.

The attached sworn declarations of Polly Wood, David Berger, Peter Cornelison, Michael Lang, Matthew Ryan, and Jeremy Bechtel document coal found along the BNSF railroad tracks in the Columbia River Gorge NSA and of at least two fugitive emission incidents that affected declarants. According to Dr. Jaffe, "some peer-reviewed published scientific papers have documented significant health effects from short-term exposure to PM2.5." Jaffe Comments at 1. These dusting incidents are sure to grow more common if there is an increase in open-top rail cars carrying coal through the Gorge as proposed by MBTL. This is a significant hazard to public health and should be mitigated in the EIS.

In fact, the DEIS itself shows that the average and maximum monthly deposition of coal dust within 100 feet of the tracks would be double the nuisance level set by the DEIS. DEIS at 6-69. The DEIS estimates that the average deposition would exceed the nuisance level at 200 feet from the tracks and that the level would be equal to the threshold at a full 250 feet in the instance of maximum monthly deposition. *Id*. This is troubling given that the flawed study likely underestimated average and maximum deposition of coal dust. Further study and modeling is necessary to adequately disclose the effects of fugitive coal dust emissions on the air quality in the Gorge. Proper mitigation measures – e.g. covering full coal cars and cleaning empty coal cars – should also be adopted as part of the EIS.

5. The DEIS fails to adequately disclose the amount of coal deposited in the aquatic environment through rail transport.

Coal spills from BNSF coal trains are currently polluting waters of the United States. Currently, three to four coal trains per day travel through Washington on the BNSF tracks. Each coal car spills an average of one pound of coal per mile.[26] Each coal train carries about 120 cars. Each train travels more than 1000 miles from the Powder River Basin to the proposed terminal in Longview. Therefore, each coal train spills about 120,000 pounds of coal between the source and the proposed terminal.

The project's direct impacts from the transportation of coal would result in discharge of coal onto lands and waters all along the rail route by every coal train servicing the terminal. The proposed terminal would transport eight loaded trains per day along the rail route. Eight loaded

[26] Simpson Weather Associates 1993. Norfolk southern rail emission study: consulting report prepared for Norfolk Southern Corporation. Charlottesville, VA.

coal trains would spill about 960,000 pounds of coal per day between the PRB and the proposed terminal.

There are approximately 300 miles of rail between Pasco and Longview. Most of this route is adjacent to the Columbia River. It is reasonable to estimate that 36,000 pounds of coal would spill between Pasco and Longview from each coal train. With eight trains per day, 280,000 pounds of coal would be spilled between Pasco and Longview per day.

The distance between the Washington state line and Pasco, the site of the second coal train spraying station, is approximately 160 miles. Each coal train would be expected to spill an average of 19,200 pounds of coal between the Washington border with Idaho and Pasco. The DEIS fails to consider the impacts of the amount of coal dust spilled between the coal mine and the proposed terminal, the amount of coal dust spilled throughout Washington State, the amount of coal dust spilled between the state border and the second surfactant spraying operation in Pasco and onward along the Columbia River to the proposed terminal.

Coal dust and debris discharged from every coal train is deposited in waterways adjacent to or near the BNSF tracks. The list of Washington rivers that would be impacted by coal spills from the project include, but are not limited to, the following: Alder Creek, Ashes Lake, Catherine Creek, Chamberlain Lake, Columbia River, Cowlitz River, Drano Lake, Duncan Creek, Franz Lake, Gibbons Creek, Horsethief Lake, Kalama River, Klickitat River, Lawton Creek, Lewis River, Little White Salmon River, Little Spearfish Lake, Major Creek, Nelson Creek, Rock Creek, Rowland Lake, Snake River, Spokane River, Wind River, White Salmon River, and Woodard Creek.

The Clean Water Act (CWA) prohibits discharge of pollutants from point sources into the waters of the United States. The CWA also prohibits discharges of pollutants from point sources onto land adjacent and in proximity to waterways where those pollutants are added to waters by forces such as, for example, gravity, wave wash, fluctuations of water levels, vibration, wind, and precipitation.

The CWA specifies a number of materials and wastes that, if discharged into water, renders them pollutants, including, but not limited to, solid waste, chemical waste, industrial waste, biological materials, sand and rock. CWA § 502(6), 33 U.S.C. § 1362(6). Under the CWA, the term "point source" means "any discernible, confined and discrete conveyance, including but not limited to any . . . container [or] rolling stock . . . from which pollutants are or may be discharged." CWA § 502(14), 33 U.S.C. § 1362(14). Rail cars are considered rolling stock and, therefore are a point source under the CWA.

To advance its goals, Congress established in the CWA that all discharges of pollutants are prohibited "except in compliance" with specified provisions of the CWA including, most importantly, the National Pollutant Discharge Elimination System (NPDES) permitting program. CWA § 301(a), 33 U.S.C. §1311(a); CWA § 402(a), 33 U.S.C. §1342(a); 40 CFR §§122.1 *et seq*.

The NPDES program requires a potential discharger of pollutants to first obtain a NPDES permit that limits the type and quantity of pollutants to be released so as to maintain water quality

standards, among other objectives. CWA § 402(a), 33 U.S.C. §1342(a); 40 CFR §122.1. No NPDES permit may be issued where discharges pursuant to it would cause receiving water-bodies to fail to meet water quality standards. *Id*. and 40 CFR §122.4 (prohibitions on permit issuance). Unless done pursuant to a NPDES permit, any coal pollutant discharge from a rail car or train into waters of the U.S. is prohibited under the CWA. BNSF has never obtained an NPDES permit allowing their discharges of coal pollutants into State of Washington waterbodies from rail cars and trains. BNSF has violated, is violating, and will continue to violate the CWA through unpermitted discharges of pollutants from its point sources onto land adjacent and in proximity to waterways where those pollutants are added to waters by forces such as, for example, gravity, wave wash, fluctuation of water levels, vibration, wind, and precipitation.

If this project is approved and built, BNSF would increase the number of CWA violations. The EIS must consider whether the proposed project is compatible with the CWA. WAC 197-11-330(3)(e)(iii). However, the DEIS fails to identify, analyze, and propose mitigation measures for the project's direct or indirect impacts caused by coal spilled from every coal car that would transport coal to the proposed terminal. Further, the DEIS fails to identify the need for an NPDES permit for the transportation of coal to the terminal and the fact that it is likely impossible for an NPDES permit to be issued for the transportation component of the project. These elements must be added to the EIS to fully disclose the slate of impacts that the proposed action would have.

6. Increased coal train traffic will cause adverse impacts to local transportation in the Gorge.

The major increase in rail traffic created by the proposed facility would cause significant adverse impacts to local transportation by increasing delays at railroad crossings. The DEIS confirms this conclusion. At full buildout, total accumulated wait times at rail crossings in Skamania County would range from one hour and fifty-two minutes per day at Skamania Landing to four hours and twenty-six minutes per day at Russell Avenue. DEIS at 5.3-38, 5.3-39. In Stevenson, traffic, including first responders, would encounter gate-down conditions over 18% of the time. Each wait there, assuming train traffic is going exactly the speed limit, would be up to 8.5 minutes with an average of 4.25 minutes. DEIS at 5.3-21, 5.3-39. The increase in vehicle delays would constitute a substantial and unavoidable impact to traffic – including to first responders.

While the EIS does identify impacts to first responders in Cowlitz County, it does not analyze the proximity of fire stations to the railroad through the Gorge nor does it analyze the potential areas impacted by waiting first responders. The analysis also does not address the cumulative impacts of all currently active coal and oil transport proposals. The analysis in the EIS should also discuss the businesses and recreation sites that could be affected by the increased delays at crossings. Importantly, the BNSF railroad lies between Washington State Route 14 and numerous recreation sites and local port districts. As such, any increase in delays at at-grade crossings would directly impact the response time for first-responders serving these areas. These impacts must be adequately documented in the EIS.

Notably, one possible mitigation measure that could reduce delays at at-grade crossings would be to construct grade-separation structures (overpasses or underpasses). The need and cost of such

mitigation can only be disclosed if sufficiently detailed analysis of impacts is disclosed in the EIS. Absent adequate disclosures, the burden of installing grade separation would be transferred to local communities and other businesses instead of the applicant. The full effects of increased wait times at crossings constitutes a significant adverse impact that must be disclosed and mitigated in the EIS.

7. The EIS must be revised to adequately disclose impacts to cultural and historic resources in the Columbia River Gorge.

The Columbia River Gorge has been inhabited since time immemorial by Native Americans. Carbon dating has documented human settlements dating back over 10,000 years. This continuous human presence has left countless cultural resource sites throughout the Gorge. Native American governments' treaties with the Unites States retained rights protecting cultural resources and hunting, fishing, and gathering sites. The EIS must disclose whether all required intergovernmental consultation with affected tribes has been completed in order to ensure that Native American cultural resources are protected.

In addition to its tribal cultural resources, the Columbia Gorge contains numerous other significant cultural and historic resources and sites. The Gorge is the final portion of Lewis and Clark's journey across the West. This seminal event in the history of the United States and the cultural landscape of the Gorge has been recognized via the designation of the Lewis and Clark National Historic Trail.

The Lewis and Clark National Historic Trail was created to "stimulate Federal, State, and local agencies and individuals to identify, mark, and preserve for public inspiration and enjoyment the routes traveled by the Lewis and Clark Expedition." Lewis and Clark Trail Management Plan at 1. The Management Plan for the trail recognizes that many of the historic and cultural resources have been altered or lost and the Expedition left scant traces of their passing. However, "[i]n a very real sense, many of the historic resources are the landmarks, vistas, flora, and fauna that make up the Trail's natural resources. It is virtually impossible to find either historic or natural resources along the Expedition route, which have not been altered in some way by man or nature." Lewis and Clark Trail Management Plan at 4 & 13. Thus, the scenery and natural resources of the Expedition's route are critical to appreciating the trail. Locations where those vistas and natural resources are intact are exceedingly rare, and warrant the greatest attention during SEPA review.

The Columbia River segment of the Lewis and Clark Trail was designated for three types of trail development: a water trail, a land trail, and a motor route. The Columbia River, Interstate 84, and Washington State Route 14 are all designated routes. The Management Plan notes that there is a "nearly continuous string of recreation sites along this segment." Lewis and Clark Trail Management Plan at 70. The National Park Service identified the following sites in the Gorge as providing interpretive opportunities:

- Maryhill State Park
- Celilo Park
- Horsethief Lake State Park
- Spearfish Lake Recreation Area

- The Dalles Dam
- Seufert Visitor Center
- Mayer State Park
- Bingen Boat Basin
- Viento State Park
- Starvation Creek State Park
- Lyndsey State Park
- Cascade Locks Marine Park
- Pacific Crest National Scenic Trail and Trailhead
- Bonneville Dam
- Beacon Rock State Park
- Rooster Rock State Park
- Lewis and Clark State Park

Lewis and Clark Trail Management Plan at 72–75. Many of these locations are historic sites where the Lewis and Clark Expedition camped on their way through the Gorge.

The designated Lewis and Clark Trail routes—State Route 14, the Columbia River, and Interstate 84—all travel parallel and adjacent to the likely transportation route for the proposed coal export facility. A significant increase in rail traffic and new rail sidings has the potential to cause significant adverse impacts to these resources.

The EIS should be revised to provide adequate disclosure of impacts to these cultural and historic resources. Notably, Native American cultural resource sites are already suffering from adverse impacts from air pollution. Increase nitrogen emissions and impacts from an coal spill could permanently destroy irreplaceable Native American sites. These impacts must be addressed in the final EIS.

7. The EIS must address degradation of the protected resources in the Columbia River Gorge from increased rail traffic and the improvements necessary to accommodate it.

The EIS acknowledges that there would be a significant increase in rail traffic if the proposal is approved and concludes that there would be significant impacts on rail transportation if rail improvements are not made. DEIS at S-41. However, the DEIS does not take into account the permanent degradation of the recreation resources of the NSA that would occur. The additional train traffic would wake campers and detract from the recreational experiences at the recreation areas in the NSA. In fact, The Oregonian reported that "When camping in the Gorge, it pays to be a little deaf" and singled out excessive train noise as a cause.[27] Cumulative adverse impacts of increased train traffic to the recreation resources of the NSA must be considered and impacts caused by past actions must be included.

The DEIS also does not analyze the significant environmental impacts that would occur if rail improvements were made to facilitate the increased traffic. According to the DEIS, there would be a 64.7% increase in rail traffic over the Fallbridge Subdivision of the BNSF line through the

[27] Available at http://blog.oregonlive.com/terryrichard/2008/05/when_ camping_columbia_gorge_it.html.

Columbia River Gorge National Scenic Area at full operation which would put the tracks at 16 trains over capacity per day.[28] DEIS at 5.1-11, 5.1-13. The DEIS acknowledges that selecting "[t]he Proposed Action would add 8 trains [per day] to a segment that would exceed capacity under 2028 baseline conditions." DEIS at 5.1-17. The DEIS then concludes that "[i]t is expected that BNSF and UP would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted."[29] DEIS at 5.1-17. This significant foreseeable indirect adverse effect must be disclosed, analyzed, and mitigated in the EIS.

SEPA requires analysis of potential conflicts with other environmental laws to determine whether "[a] proposal may to a significant degree . . . [c]onflict with local, state, or federal laws or requirements for the protection of the environment." WAC 197-11-330(3)(e)(iii). The Columbia River Gorge National Scenic Area Act establishes land use development standards for all land within the National Scenic Area, excluding certain designated Urban Areas. Independent of the Scenic Area Act's mandates, SEPA requires that the EIS must include analysis of the likely increase in rail traffic and any accompanying expansions of railroad facilities within the National Scenic Area. Since the project would require extra rail capacity through the Gorge, the EIS must identify where new construction would be likely to occur in the National Scenic Area and the impacts that would occur to resources protected by the Gorge Act, the Gorge Management Plan, and local implementing ordinances. Deferring this analysis to later study does not satisfy SEPA requirements.

Furthermore, railroads benefit from sweeping preemption of local laws and they will likely assert that the preemption applies to local laws that implement the Gorge Act. In fact, Union Pacific already has asserted that the laws that protect the NSA are preempted.[30] While we believe the

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[28] There is an inconsistency between Table 5.1-3 and Table 5.1-5 on the resulting number of trains over capacity this subdivision would be if the proposal moves forward.

[29] The DEIS attempts to have it both ways. If rail infrastructure would not be built, the extra congestion of the rails caused by the proposed action would have significant adverse impacts on rail transportation, rail safety, traffic, air quality, etc. If the extra infrastructure necessitated by the proposed action were built, it would have significant adverse effects on the scenic, cultural, recreational, and natural resources of the Gorge NSA. A conservative document would take both sets of impacts into account while an adequate document would take the most likely scenario – that the extra infrastructure would be built – into account. The DEIS does neither and is thus insufficient.

[30] Union Pacific recently wrote the following in a cover letter to Wasco County Oregon regarding permits it is seeking to build new track within the Columbia River Gorge NSA: "Ordinarily, an interstate railroad is not required to obtain state or local construction permits to build any facility that is integrally related to the railroad's transportation operations. Under the ICC Termination Act of 1995 (ICCTA), the federal Surface Transportation Board (STB) is vested with exclusive jurisdiction over interstate rail transportation (49 U.S.C. § 10501[b]). The ICCTA categorically preempts – regardless of context or rationale for the action – any form of state or local permitting that (1) could be used to deny the railroad the ability to conduct some part of its operations or (2) purports to regulate matters already regulated by the STB such as the construction of rail lines (Village of Big Lake v. BNSF Ry. Co., 382 S.W.3d 125, 129 [Mo. App. 2012]). . . . Nevertheless, as a policy matter, UPRR routinely applies for state and local construction permits and does not invoke ICCTA preemption unless the permitting becomes unduly prolonged or conditions are imposed that are incompatible with UPRR's operating needs. Accordingly, the enclosed application is provided for your review." Available at http://co.wasco.or.us/planning

federal nature of the Gorge Act negates the preemption that Union Pacific asserts, this issue would require litigation and it could conceivably fall in the favor of the railroads. In that instance, this SEPA review is the only place to address railroad construction impacts to the Gorge NSA. As such, the EIS must address these impacts to the protected resources of the NSA and identify where the construction will be inconsistent with the Gorge Act, the Gorge Management Plan, and local ordinances.

In addition, the DEIS does not include the impacts on the Gorge resources due to more Union Pacific trains running on the South side of the Columbia River. These trains will also have significant scenic and air quality impacts on the Gorge on both the Washington and Oregon sides of the state line. For example, in windy conditions like those often experienced in the Gorge, PM 2.5 can travel long distances and coal dust emitted on the Oregon side of the Columbia River due to the proposed project could cumulatively raise PM 2.5 levels in Washington over the NAAQS thresholds. Adverse effects of the project should not be ignored simply because they originate out of state. The increased rail traffic would also require the construction of new rail capacity on the Oregon side of the Columbia River, degrading the aesthetic resources of the Gorge in Washington. These adverse effects must be disclosed in the EIS.

Either rail capacity would be increased due to the proposed project – resulting in significant adverse impacts to the protected resources of the Gorge – or rail capacity would not be increased and rail transportation would be negatively affected – resulting in a significant adverse impact to rail traffic in the Gorge. The conclusion that it is uncertain that the increase in rail will cause significant adverse effects on the environment is simply not supported by the DEIS. The EIS must disclose, analyze, and mitigate these significant adverse effects.

The DEIS also excluded the impacts of the new construction of railroad infrastructure in the Gorge by restricting the environmental resource area study areas in Chapters 3 and 4. The entire point of an EIS is to disclose all of the direct and indirect impacts of a proposed project. Excluding the foreseeable indirect impacts on the protected resources of the Gorge is impermissible and baffling. WAC 197-11-060(4)(b). Some of the environmental resource areas that have under-inclusive study areas and/or exclude the foreseeable railroad construction activities that would take place in the Gorge and would negatively impact the scenic, cultural, recreational, and natural resources protected by the Gorge Act, the Gorge management Plan, and local ordinances include:

- Section 3.1 Land and Shoreline Use
    - Land and Shoreline Use, including Zoning and Consistency with Comprehensive Plans
    - Parks and Recreation Facilities
    - Agricultural Land
- Section 3.2 Social and Community Resources
    - Social and Community Cohesion and Public Services
    - Local Economy

/landuse_actions/UPRR_PLASAR-15-01-0004/00_Cover-Letter.pdf. The explicit threat in the cover letter – approve our project quickly with minimal conditions of approval or we will invoke federal preemption – does not provide much confidence that the railroad will comply with scenic area permitting requirements if they become inconvenient.

    - Minority and Low-Income Populations
- Section 3.3 Aesthetics, Light, and Glare
- Section 3.4 Cultural Resources
- Section 3.5 Tribal Resources
- Section 4.2 Surface Water and Floodplains
- Section 4.3 Wetlands
- Section 4.5 Water Quality
- Section 4.6 Vegetation
- Section 4.7 Fish
- Section 4.8 Wildlife

The EIS must disclose and analyze the adverse effects of the rail construction on these resources areas in the Gorge. Where there will be significant adverse effects, the EIS should propose mitigation measures to comply with the Gorge Act, the Gorge Management Plan, and with local ordinances implementing the Plan.

8. The cumulative impacts analysis does not adequately take into account the effects of past actions.

The cumulative impacts analysis is inadequate. While acknowledging that "impacts from past, present, and reasonably foreseeable future actions" must be considered, the DEIS instead discounts the effects of the proposed action and the significance of the cumulative effects of past and proposed actions. The cumulative impacts section functionally sets an environmental baseline as the environment exists today and concludes that the camel's back is already broken – so what's one more straw? This is not the intent of a cumulative impacts assessment. Instead, if there are already significant unavoidable cumulative adverse impacts no more should be added to the mix. The EIS should be reworked to reflect this reality and then the project should be denied.

9. Conclusion

The EIS must disclose the direct, indirect, and cumulative impacts of the proposal. The DEIS, despite its flaws, documents that the MBTL coal export terminal would cause unavoidable significant adverse impacts to the Columbia River Gorge and that there are no feasible mitigation measures that would reduce those impacts to acceptable levels. Based on this information, Ecology and the County have sufficient information to reject the proposal. To clarify the basis for denying the application, the EIS should be revised to provide adequate disclosure of the full extent of impacts to the Columbia River Gorge.

Sincerely,

Steven D. McCoy
Staff Attorney

Enclosures: Coal Dust Pollution in the Columbia River Gorge National Scenic Area, Friends of the Columbia Gorge
Columbia River Gorge National Scenic Area Act
Management Plan for the Columbia River Gorge NSA
Comments on Tongue River RR DEIS, Dr. Ranajit Sahu
Coal Train Pollution Signature Study, Nick Higginbotham, et. al.
Comments on Longview DEIS- Chapter 5.7: Coal Dust, Dr. Daniel Jaffe
Declaration of Matthew Ryan in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss
Declaration of Jeremy Bechtel in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss
Exhibit 1 to Declaration of Jeremy Bechtel in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss
Declaration of Polly Wood in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss
Declaration of David Berger in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss
Declaration of Peter Cornelison in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss
Declaration of Michael Lang in Support of Plaintiffs' Opposition to Defendant's Motion to Dismiss

cc: Lynn Burditt, Area Manager, USDA Forest Service, CRGNSA Office
Krystyna U. Wolniakowski, Executive Director, Columbia River Gorge Commission
Dan Wiley, Chief, National Park Service, Lewis and Clark National Historic Trail
Matthew R. Kernutt, AAG, Counsel for the Environment, Office of the Attorney General

Coal Dust Pollution in the Columbia River Gorge National Scenic Area

Prepared by Michael Lang, Conservation Director, Friends of the Columbia Gorge

June 9, 2016

Burlington Northern Santa Fe Railway (BNSF) transports coal by rail through the Columbia River Gorge National Scenic Area in open-topped coal cars. Three to four trains, each more than one mile-long, travel from the Powder River Basin (PRB) in Wyoming and Montana through the Columbia River Gorge every day. Coal discharged from nearly every coal train from the PRB pollutes lands and waters in the Columbia River Gorge. In some places, like Columbia Hills State Park in Klickitat County, coal accumulations is several inches deep on the shoreline of the Columbia River. If the Millennium Bulk Terminal proposed in Longview, Washington is built, an additional eight loaded coal trains with open coal cars would travel through the Gorge, further polluting the National Scenic Area, the Columbia River and its tributaries with toxic coal. The photos below focus on Columbia Hills State park, just one of many sites in the Columbia River Gorge that is continuously polluted with dust and debris from passing BNSF coal trains. These photos demonstrate that the transport of coal in open rails cars has polluted and will continue to pollute the Columbia River Gorge despite the application of surfactant at the PRB mines and the installation of a surfactant re-spray facility in Pasco, Washington.

July, 2012 - Coal dust flies off a BNSF coal train into the Columbia River at Columbia Hills State Park.
Photo: Julie Coop

Early 2013 – A thick layer of coal debris covered the soil in an area east of the boat launch at Columbia Hills State Park. Photo: Friends of the Columbia Gorge

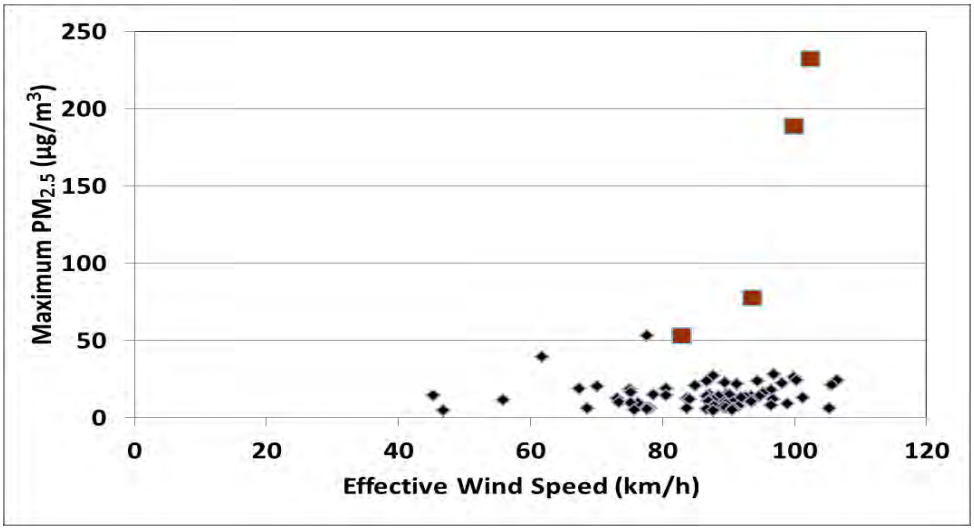
March 25, 2013 - Coal debris deposited from passing coal trains on the BNSF rail line is several inches thick along Columbia River at Columbia Hills State Park. Photo: Friends of the Columbia Gorge

March 25, 2013 - Coal debris adjacent to BNSF's railroad track along the banks of the Columbia River at Columbia Hills State Park. The U.S. Surface Transportation Board declared that coal is a "pernicious ballast foulant" that destabilizes railroad tracks and leads to more accidents.
http://www.troutmansandersenergyreport.com/wp-content/uploads/2011/03/Coal-Dust.pdf
Photo: Friends of the Columbia Gorge

August 21, 2013 - Coal several inches deep from passing coal trains on the banks of the Columbia River has replaced the soil at Columbia Hills State Park. Nothing grows here but a few invasive weeds. Coal blows directly into the Columbia River in violation of the Clean Water Act. Friends of the Columbia Gorge and its allies are currently suing BNSF for unpermitted discharge of coal into the Columbia River and other water bodies in Washington State. Photo: Friends of the Columbia Gorge

November 2015 – Dr. Dan Jaffe published a report titled "Diesel particulate matter and coal dust from trains in the Columbia River Gorge, Washington State, USA" in the Atmospheric Pollution Journal. This report monitored coal dust in the Columbia River Gorge on the BNSF rail line during the summer of 2014. The report found that nearly every coal train emits coal dust; coal trains emit double the PM 2.5 concentrations compared to other freight trains; 5.4% of coal trains emit thick clouds of coal dust; and 10.3% emit visible clouds of coal dust when the effective wind speed (the sum of the wind speed and the speed of the train) exceeds 90 kph (56 mph).
http://www.atmos.washington.edu/jaffegroup/modules/APOLLO/Jaffe_DPM_coal_dust_trains_ColumbiaRivGorge_2015.pdf

Summer 2014 - Thick plume of coal dust blows off a BNSF coal train in the Columbia River Gorge.
http://www.atmos.washington.edu/jaffegroup/modules/APOLLO/Jaffe_Video_Coal_train_Aug7_2014.mp4



One in ten coal trains emits visible plumes of coal dust at effective speeds of 90 kph (56 mph) or more.

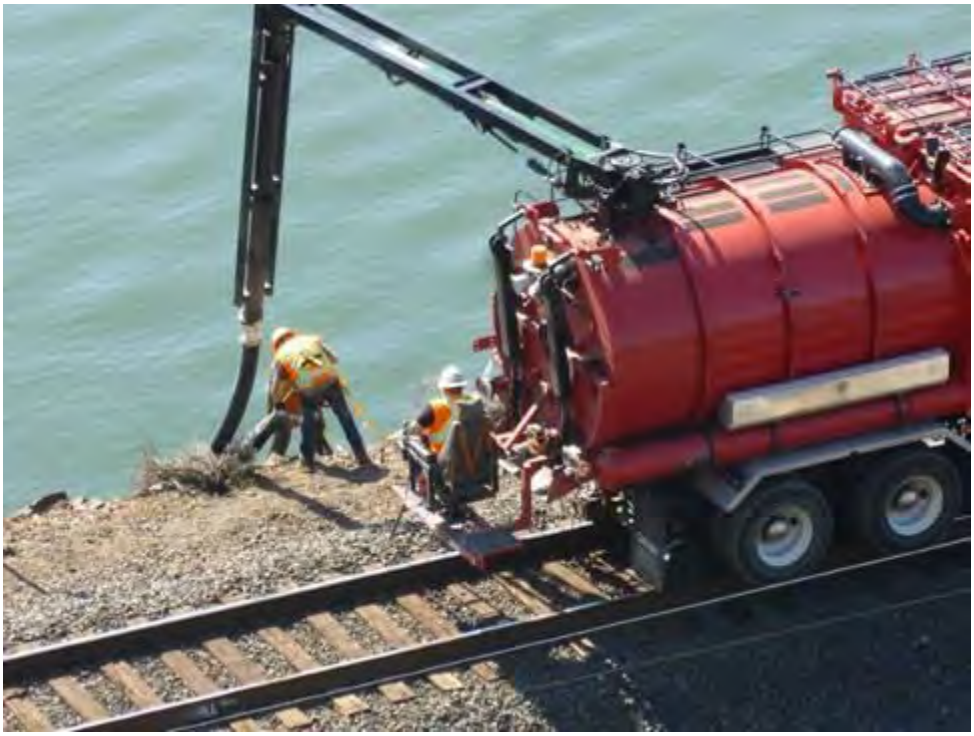
January, 2015 - BNSF began operating a re-spray facility in Pasco due to the failure of the surfactant sprayed on coal cars at the mines in the Powder River Basin to control coal dust and debris. The Tri-City Herald Newspaper also reports that BNSF treats coke trains at the facility.
https://www.youtube.com/watch?v=EYpYOfMFBAI

May 22, 2015 – Hikers at Columbia Hills State Park on the trail to the iconic petroglyph "Tsagaglalal" (She Who Watches) witnessed and photographed this passing train with black clouds of coal or coke blowing on to the state park and the Columbia River. According to the Tri-City Herald, BNSF sprays both coal and coke trains in Pasco. http://www.tri-cityherald.com/news/local/article80608512.html

May 22, 2015 – These photos of a BNSF train with what appears to be coal blowing off of coal hoppers into the Columbia River at Columbia Hills State Park several months *after* the Pasco re-spray facility became operational. Photo: Laura Foster

April 2016 – Coal dust vacuum truck at Columbia Hills State Park.

April 25, 2016 - BNSF vacuum truck removing coal debris from the banks of the Columbia River at Columbia Hills State Park. Photo: Mary Ann Teague



April 25, 2016 - BNSF contractors use a vacuum truck to attempt to remove coal debris along the BNSF track and the shoreline of the Columbia River near Horsethief Butte at Columbia Hills State Park in the Columbia River Gorge. Photo: Mary Ann Teague

April, 2016 –Photo: Friends of the Columbia Gorge

April, 2016 - The two photos above show the area directly east of the boat launch site at Columbia Hills State Park that had been recently vacuumed of coal dust and debris that routinely blows off of passing coal trains. There is still some coal dust visible in the photo. Photo: Friends of the Columbia Gorge

May 17, 2016 - BNSF vacuum truck prepares to transfer coal that was removed from the shoreline of the Columbia River to a truck for transport to the Roosevelt Regional Landfill. This site is located adjacent to the boat launch at Columbia Hills State Park. Photo: Friends of the Columbia Gorge

May 17, 2016 – Area adjacent to the boat launch, Columbia Hills State Park. Photo: Friends of the Columbia Gorge

May 17, 2016 – The three photos above show coal dust and debris accumulation in an area previously vacuumed by BNSF at Columbia Hills State Park, adjacent to the public boat launch. Coal continues to be discharged from BNSF coal trains despite the re-spray facility in Pasco, Washington that has been in operation since January 2015. Photo: Friends of the Columbia Gorge

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA ACT[1]

(as amended through November 2003)

16 U.S.C. § 544

Sec. 2. Columbia River Gorge National Scenic Area; definitions

As used in sections 544 to 544p of this title, the term –

(a) "adversely affect" or "adversely affecting" means, except as used in section 544m of this title, a reasonable likelihood of more than moderate adverse consequences for the scenic, cultural, recreation or natural resources of the scenic area, the determination – of which is based on -

(1) the context of a proposed action;

(2) the intensity of a proposed action, including the magnitude and duration of an impact and the likelihood of its occurrence;

(3) the relationship between a proposed action and other similar actions which are individually insignificant but which may have cumulatively significant impacts; and

(4) proven mitigation measures which the proponent of an action will implement as part of the proposal to reduce otherwise significant affects to an insignificant level;

(b) "agricultural lands" means lands designated as agricultural lands pursuant to section 544d of this title;

(c) "Commission" means the Columbia River Gorge Commission established pursuant to section 544c of this title;

(d) "counties" means Hood River, Multnomah, and Wasco Counties, Oregon; and Clark, Klickitat, and Skamania Counties, Washington;

(e) "Dodson/Warrendale Special Purchase Unit" means the Dodson/Warrendale Special Purchase Unit established pursuant to section 544b of this title;

(f) "forest lands" means lands designated as forest lands pursuant to section 544d of this title;

(g) "Indian tribes" means the Nez Perce Tribe, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Warm Springs of Oregon, and the Confederated Tribes of the Umatilla Indian Reservation;

(h) "interim guidelines" means any interim guidelines developed by the Secretary pursuant to section 544h of this title, and any amendment, revision, or variance;

(i) "land use ordinance" or "ordinance" means any ordinance adopted by a county or by the Commission pursuant to sections 544 to 544p of this title, and includes any amendment to, revision of, or variance from such ordinance;

(j) "major development actions" means any of the following:

(1) subdivisions, partitions and short plat proposals;

(2) any permit for siting or construction outside urban areas of multifamily residential, industrial or commercial facilities, except such facilities as are included in the recreation assessment;

(3) the exploration, development and production of mineral resources unless such exploration, development or production can be conducted without disturbing the surface of any land within the boundaries of a special management area or is

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[1] Note: This compilation was downloaded from *http://uscode.house.gov/*. This compilation does not include any of the codification notes except for footnotes and legislative source notes. While the Columbia River Gorge Commission believes this is an accurate compilation as of the date stated above, persons relying on this compilation do so at their own risk. All persons are advised to seek the assistance of an attorney.

for sand, gravel and crushed rock used for the construction, maintenance or reconstruction of roads within the special management areas used for the production of forest products; and

(4) permits for siting or construction within a special management area of any residence or other related major structure on any parcel of land less than forty acres in size;

(k) "management plan" means the scenic area management plan adopted pursuant to section 544d of this title;

(l) "open spaces" means unimproved lands not designated as agricultural lands or forest lands pursuant to section 544d of this title and designated as open space pursuant to section 544d of this title. Open spaces include –

(1) scenic, cultural, and historic areas;

(2) fish and wildlife habitat;

(3) lands which support plant species that are endemic to the scenic area or which are listed as rare, threatened or endangered species pursuant to State or Federal Endangered Species Acts;

(4) ecologically and scientifically significant natural areas;

(5) outstanding scenic views and sites;

(6) water areas and wetlands;

(7) archaeological sites, Indian burial grounds and village sites, historic trails and roads and other areas which are culturally or historically significant;

(8) potential and existing recreation resources; and

(9) Federal and State wild, scenic, and recreation waterways;

(m) "recreation assessment" means the recreation assessment adopted pursuant to section 544d of this title;

(n) "residential development" means the permitting for siting or construction of any residence or other related major structure;

(o) "scenic area" means the Columbia River Gorge National Scenic Area established pursuant to section 544b of this title;

(p) "Secretary" means the Secretary of Agriculture;

(q) "special management areas" means areas within the scenic area established pursuant to section 544b of this title;

(r) "States" means the States of Oregon and Washington; and

(s) "urban areas" means those areas within the scenic area identified as urban areas on the map referred to in section 544b(e) of this title or within the boundaries of an urban area as revised pursuant to section 544b(f) of this title.

(Pub. L. 99-663, Sec. 2, Nov. 17, 1986, 100 Stat. 4274; Pub. L. 103-435, Sec. 17(b), Nov. 2, 1994, 108 Stat. 4573.)

§ 544a Sec. 3. Purposes

The purposes of sections 544 to 544p of this title are –

(1) to establish a national scenic area to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge; and

(2) to protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with paragraph (1)

(Pub. L. 99-663, Sec. 3, Nov. 17, 1986, 100 Stat. 4276.)

§ 544b Sec. 4. Establishment of scenic area

(a) National scenic area

(1) There is hereby established the Columbia River Gorge National Scenic Area.

(2) Boundaries. –

(A) In general. – Except as provided in subparagraph (B), the boundaries of the scenic area shall be generally depicted on the map entitled "Boundary Map, Columbia River Gorge National Scenic Area," numbered NSA-001 sheets 1 and 2, and dated September 1986, which shall be on file and available for public inspection in the offices of the Commission and of the Chief, Forest Service.

(B) Exclusions. – The scenic area shall not include the approximately 29 acres of land owned by the Port of Camas-Washougal in the South 1/2 of Section 16, Township 1 North, Range 4 East, and the North 1/2 of Section 21, Township 1 North, Range 4 East, Willamete[2] Meridian, Clark County, Washington, that consists of -

(i) the approximately 19 acres of Port land acquired from the Corps of Engineers under the Second Supplemental Appropriations Act, 1984 (Public Law 98-396); and

(ii) the approximately 10 acres of adjacent Port land to the west of the land described in clause (i)

(b) Special management areas

(1) The following areas within the boundaries of the scenic area are hereby designated "Special Management Areas": Gates of the Columbia River Gorge; Wind Mountain; Burdoin Mountain; and Rowena.

(2) The boundaries of the special management areas designated by paragraph (1) –

(A) shall be generally depicted on the map entitled "Special Management Areas, Columbia River Gorge National Scenic Area", numbered SMA-002 sheets 1 through 17, and dated September 1986, which shall be on file and available for public inspection in the offices of the Commission and of the Chief, Forest Service; and

(B) shall include all islands within the boundaries of the scenic area.

(3) Modification of boundaries. - The boundaries of the special management areas are modified as depicted on a map dated September 20, 2000, which shall be on file and available for public inspection in the office of the Chief of the Forest Service in Washington, District of Columbia, and copies shall be available in the office of the Commission, and the headquarters of the scenic area.

(c) Revision of special management area boundaries. The Secretary, in consultation with the Commission, may make minor revisions in the boundaries of special management areas after publication of notice to that effect in the Federal Register and submission of notice thereof to the Committee on Energy and Natural Resources of the United States Senate and the Committees on Agriculture and Natural Resources of the United States House of Representatives. Such notice shall be published and submitted at least sixty days before the revision is made. Notice of final action regarding such revision shall also be published in the Federal Register.

(d) Dodson/Warrendale Special Purchase Unit

(1) There is hereby established the Dodson/Warrendale Special Purchase Unit.

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[2] So in original. Probably should be "Willamette".

(2) The boundaries of the Dodson/Warrendale Special Purchase Unit shall be generally depicted on the map entitled "Dodson/Warrendale Special Purchase Unit, Columbia River Gorge National Scenic Area", numbered SPU-003 sheet 1, and dated September 1986, which shall be on file and available for public inspection in the offices of the Commission and of the Chief, Forest Service.

(e) Urban areas

(1) The following cities and towns are hereby designated as "Urban Areas": Cascade Locks, Hood River, Mosier, and The Dalles, Oregon; and Bingen, Carson, Dallesport, Home Valley, Lyle, North Bonneville, Stevenson, White Salmon, and Wishram, Washington.

(2) The boundaries of urban areas shall be generally depicted on the map entitled, "Urban Areas, Columbia River Gorge National Scenic Area", numbered UA-004 sheets 1 through 11, and dated September 1986, which shall be on file and available for public inspection in the offices of the Commission and of the Chief, Forest Service. The boundaries of urban areas designated in this subsection may be revised pursuant to the provisions of this section.

(f) Revision of urban area boundaries

(1) Upon application of a county and in consultation with the Secretary, the Commission may make minor revisions to the boundaries of any urban area identified in subsection (e) of this section. A majority vote of two-thirds of the members of the Commission, including a majority of the members appointed from each State, shall be required to approve any revision of urban area boundaries.

(2) The Commission may revise the boundaries of an urban area only if it finds that -

(A) a demonstrable need exists to accommodate long-range urban population growth requirements or economic needs consistent with the management plan;

(B) revision of urban area boundaries would be consistent with the standards established in section 544d of this title and the purposes of sections 544 to 544p of this title;

(C) revision of urban area boundaries would result in maximum efficiency of land uses within and on the fringe of existing urban areas; and

(D) revision of urban area boundaries would not result in the significant reduction of agricultural lands, forest lands, or open spaces.

(Pub. L. 99-663, Sec. 4, Nov. 17, 1986, 100 Stat. 4276; Pub. L. 103-437, Sec. 6(d)(34), Nov. 2, 1994, 108 Stat. 4585; Pub. L. 105-277, div. A, Sec. 101(e) (title III, Sec. 354(a)), Oct. 21,1998, 112 Stat. 2681-231, 2681-303; Pub. L. 106-31, title V, Sec.5004(3), May 21, 1999, 113 Stat. 110; Pub. L. 106-291, title III, Sec. 346(d), Oct. 11, 2000, 114 Stat. 1000.)

§ 544c Sec. 5. Columbia River Gorge Commission

(a) Establishment and membership of Commission

(1) To achieve the purposes of sections 544 to 544p of this title and to facilitate cooperation among the States of Oregon and Washington, and with the United States of America, the consent of Congress is given for an agreement described in sections 544 to 544p of this title pursuant to which, within one year after November 17, 1986 -

(A) the States of Oregon and Washington shall establish by way of an interstate agreement a regional agency known as the Columbia River Gorge Commission, and shall incorporate sections 544 to 544p of this title

by specific reference in such agreement. The Commission shall carry out its functions and responsibilities in accordance with the provisions of the interstate agreement and of sections 544 to 544p of this title and shall not be considered an agency or instrumentality of the United States for the purpose of any Federal law;

(B) the States of Oregon and Washington shall provide to the Commission, State agencies, and the counties under State law the authority to carry out their respective functions and responsibilities in accordance with the provisions of paragraph (1)(A) of this subsection; and

(C) the States of Oregon and Washington shall appoint members of the Commission as provided in clauses (i) through (iii), subject to applicable State law: Provided, That the Governor of either State may extend the time for appointment of Commission members ninety days to provide more time for the States and counties to make such appointments. Membership of the Commission shall be as follows:

(i) six members, comprised of one resident from each of the following counties: Hood River, Multnomah, and Wasco Counties, Oregon, and Clark, Klickitat, and Skamania Counties, Washington, to be appointed by the governing body of each of the respective counties: Provided, That in the event the governing body of a county fails to make such appointment, the Governor of the State in which the county is located shall appoint such member;

(ii) three members who reside in the State of Oregon, at least one of whom shall be a resident of the scenic area, to be appointed by the Governor of Oregon;

(iii) three members who reside in the State of Washington, at least one of whom shall be a resident of the scenic area, to be appointed by the Governor of Washington; and

(iv) one ex officio, nonvoting member who shall be an employee of the Forest Service, to be appointed by the Secretary.

(2) The agreement shall take effect and the Commission may exercise its authorities pursuant to the agreement upon the appointment of four initial members from each State, subject to applicable State law, and the date of such an agreement shall be the date of establishment of the Commission. Such agreement is hereby consented to by the Congress.

(3) Either State or any county may fill any vacancy occurring prior to the expiration of the term of any member originally appointed by that State or county. Each member appointed to the Commission shall serve a term of four years, except that, with respect to members initially appointed pursuant to paragraph (1)(C)(i), each Governor shall designate one member to serve for a term of five years and one to serve for a term of six years, and one member from each State initially appointed pursuant to paragraph (1)(C)(ii) and (iii) shall be designated by the Governor to serve a term of five years, and one to serve a term of six years. Neither the Governors nor the governing bodies of any of the counties may appoint Federal, State, or local elected or appointed officials to the Commission.

(4) A majority of the members of the Commission shall constitute a quorum. The members of the Commission shall select from among themselves a Chairman by majority vote of the members appointed from each State.

(5) Except for the ex-officio member appointed pursuant to paragraph (1)(C)(iv), the members and officers and employees of the Commission shall not be officers or employees of the United States for any purpose. The Commission shall appoint, fix compensation for, and assign and delegate duties to such officers and employees as the Commission deems necessary to fulfill its functions under sections 544 to 544p of this title. The compensation of Commission members shall be fixed by State law. The compensation of Commission members, officers, and employees and the expenses of the Commission shall be paid from funds provided to the Commission by the States.

(b) Applicable law. For the purposes of providing a uniform system of laws, which, in addition to sections 544 to 544p of this title, are applicable to the Commission, the Commission shall adopt regulations relating to administrative procedure, the making of contracts, conflicts-of-interest, financial disclosure, open meetings of the Commission, advisory committees, and disclosure of information consistent with the more restrictive statutory provisions of either State. Regulations applicable to financial disclosure under this subsection shall be applied to members of the Commission without regard to the duration of their service on the Commission or the amount of compensation received for such service. No contract, obligation, or other action of the Commission shall be an obligation of the United States or an obligation secured by the full faith and credit of the United States.

(c) Assistance to Commission. Upon the request of the Commission, the Secretary and other Federal agencies are authorized to provide information, personnel, property, and services on a reimbursable basis, and the Secretary is authorized to provide technical assistance on a nonreimbursable basis, to the Commission to assist it in carrying out its functions and responsibilities pursuant to sections 544 to 544p of this title.

(d) Advisory committees. The Commission shall establish voluntary technical and citizen advisory committees to assist the Commission in carrying out its functions and responsibilities pursuant to sections 544 to 544p of this title.

(Pub. L. 99-663, Sec. 5, Nov. 17, 1986, 100 Stat. 4277.)

§ 544d **Sec. 6. Scenic area management plan**

(a) Studies. Within one year after the date the Commission is established, it shall, in cooperation with the Secretary, complete the following studies for use in preparing the management plan:

(1) Resource inventory. The Commission shall complete a resource inventory. The resource inventory shall –

(A) document all existing land uses, natural features and limitations, scenic, natural, cultural, archaeological and recreation and economic resources and activities: Provided, That the location of any Indian burial grounds, village sites, and other areas of archaeological or religious significance shall not be made public information and such information shall be used for administrative purposes only; and

(B) incorporate without change the resource inventory developed by the Secretary pursuant to section 544f of this title for the special management areas.

(2) Economic opportunity study. The Commission shall complete a study to identify opportunities to enhance the economies of communities in the scenic area in a manner consistent with the purposes of sections 544 to 544p of this title.

(3) Recreation assessment. The Commission shall complete an assessment of recreation resources and opportunities for enhancement of these resources. The recreation assessment shall –

(A) designate the location and specify the construction of an interpretive center or other appropriate facility, to be located in the State of Oregon, and of a conference center or other appropriate facility, to be located in the State of Washington;

(B) identify areas within the scenic area that are suitable for other public use facilities, including but not limited to educational and interpretive facilities, campsites, picnic areas, boat launch facilities and river access areas; and

(C) subject to the treaty and other rights of Indian tribes, designate areas to provide increased access for recreation purposes to the Columbia River and its tributaries; and

(D) incorporate without change the recreation assessment developed by the Secretary pursuant to section 544f of this title for the special management areas;

(b) Land use designations. Within two years after the Commission is established, it shall develop land use designations for the use of non-Federal lands within the scenic area. The land use designations shall –

(1) be based on the results of the resource inventory developed pursuant to subsection (a)(1) of this section, and consistent with the standards established in subsection (d) of this section;

(2) agricultural products or the sustenance of livestock as agricultural lands;

(3) designate lands used or suitable for the production of forest products as forest lands;

(4) designate lands suitable for the protection and enhancement of open spaces;

(5) designate areas in the scenic area outside special management areas used or suitable for commercial development: Provided, That such designation shall encourage, but not require, commercial development to take place in urban areas and shall take into account the physical characteristics of the areas in question and their geographic proximity to transportation, commercial, and industrial facilities and other amenities;

(6) designate areas used or suitable for residential development, taking into account the physical characteristics of the areas in question and their geographic proximity to transportation and commercial facilities and other amenities; and

(7) incorporate without change the designation of urban areas established in section 544b(e) of this title.

(c) Adoption of management plan. Within three years after the date the Commission is established, it shall adopt a management plan for the scenic area. The Commission

shall adopt the management plan by a majority vote of the members appointed, including at least three members from each State. The management plan shall -

(1) be based on the results of the resource inventory developed pursuant to subsection (a)(1) of this section;
(2) include land use designations developed pursuant to subsection (b) of this section;
(3) be consistent with the standards established in subsection (d) of this section;
(4) incorporate without change the management direction for the use of Federal lands within and the land use designations for the special management areas adopted by the Secretary pursuant to section 544f of this title; and
(5) include guidelines for the adoption of land use ordinances for lands within the scenic area. The guidelines –
    (A) shall incorporate without change the guidelines for the development of special management area land use ordinances developed by the Secretary pursuant to section 544f of this title; and
    (B) shall not apply to urban areas designated in section 544b(e) of this title.

(d) Standards for management plan. The management plan and all land use ordinances and interim guidelines adopted pursuant to sections 544 to 544p of this title shall include provisions to -

(1) protect and enhance agricultural lands for agricultural uses and to allow, but not require, conversion of agricultural lands to open space, recreation development or forest lands;
(2) protect and enhance forest lands for forest uses and to allow, but not require, conversion of forest lands to agricultural lands, recreation development or open spaces;
(3) protect and enhance open spaces;
(4) protect and enhance public and private recreation resources and educational and interpretive facilities and opportunities, in accordance with the recreation assessment adopted pursuant to subsection (a) of this section;
(5) prohibit major development actions in special management areas, except for partitions or short plats which the Secretary determines are desirable to facilitate land acquisitions pursuant to sections 544 to 544p of this title;
(6) prohibit industrial development in the scenic area outside urban areas;
(7) require that commercial development outside urban areas take place without adversely affecting the scenic, cultural, recreation, or natural resources of the scenic area;
(8) require that residential development outside urban areas take place without adversely affecting the scenic, cultural, recreation, and natural resources of the scenic area; and
(9) require that the exploration, development and production of mineral resources, and the reclamation of lands thereafter, take place without adversely affecting the scenic, cultural, recreation and natural resources of the scenic area.

(e) Agency consultation and public involvement. The Secretary and the Commission shall exercise their responsibilities pursuant to sections 544 to 544p of this title in consultation with Federal, State, and local governments having jurisdiction within the scenic area or expertise pertaining to its administration and with Indian tribes. The Secretary and the Commission shall conduct public hearings and solicit public comment prior to final adoption of the management plan and the Commission shall

conduct public hearings and solicit public comment prior to final adoption of land use ordinances. The Commission and the appropriate county shall promptly notify the Secretary, the States, local governments and Indian tribes of all proposed major development actions and residential development in the scenic area.

(f) Concurrence of management plan

(1) Review by Secretary. Upon adoption of the management plan, the Commission shall promptly submit the plan to the Secretary for review. If the Secretary agrees with the Commission that the management plan is consistent with the standards established in this section and the purposes of sections 544 to 544p of this title, the Secretary shall concur to that effect. Should the Secretary fail to act on the proposed plan within ninety days, the Secretary shall be deemed to have concurred on the management plan.

(2) Denial of concurrence. If concurrence is denied, the Secretary shall state the reasons for finding the plan is inconsistent with the standards established in this section or the purposes of sections 544 to 544p of this title, and shall submit to the Commission suggested modifications to the management plan to make it consistent with such standards and the purposes of sections 544 to 544p of this title.

(3) Commission reconsideration. Within one hundred and twenty days after receipt of notification of non-concurrence, the Commission shall -

(A) revise and resubmit the plan to the Secretary; or

(B) by a vote of two-thirds of its membership, including a majority of the members appointed from each State, reject the suggested modifications of the Secretary and adopt a management plan consistent with the provisions of this section and the purposes of sections 544 to 544p of this title.

(g) Revision of plan. No sooner than five years after adoption of the management plan, but at least every ten years, the Commission shall review the management plan to determine whether it should be revised. The Commission shall submit any revised management plan to the Secretary for review and concurrence, in accordance with the provisions of this section for adoption of the management plan.

(h) Amendment of plan. If the Commission determines at any time that conditions within the scenic area have significantly changed, it may amend the management plan. The Commission shall submit amendments to the management plan to the Secretary for review, in accordance with the provisions of this section for adoption of the management plan.

(Pub. L. 99-663, Sec. 6, Nov. 17, 1986, 100 Stat. 4279.)

§ 544e Sec. 7. Administration of scenic area

(a) Management of scenic area. The non-Federal lands within the scenic area shall be administered by the Commission in accordance with the management plan and sections 544 to 544p of this title.

(b) Adoption of scenic area land use ordinances

(1) Within sixty days of initial receipt of the management plan, each county shall submit to the Commission a letter stating that it proposes to adopt a land use ordinance consistent with the management plan. If any county fails to submit such letter or fails to adopt a land use ordinance as provided in this section, the Commission shall carry out the requirements of subsection (c) of this section.

(2) Within two hundred and seventy days of receipt of the management plan, each county shall adopt a land use ordinance consistent with the management plan, and thereafter may adopt an amendment, revision or variance to a land use ordinance at any time. Each county upon adoption of a land use ordinance shall promptly submit the ordinance to the Commission.

(3) Approval by commission.

(A) Within ninety days after receipt of a land use ordinance, the Commission, by majority vote including at least three members from each State, shall approve the ordinance unless it determines the ordinance is inconsistent with the management plan. Should the Commission fail to act within ninety days, the ordinance shall be deemed to be approved.

(B) If approval is denied, the Commission shall state the reasons for finding the ordinance is inconsistent with the management plan, and shall submit to the county suggested modifications to the ordinance to make it consistent with the management plan.

(C) Each county shall have ninety days after it receives recommendations from the Commission to make modifications designed to eliminate the inconsistencies and to resubmit the ordinance to the Commission for approval. The Commission shall have sixty days to approve or disapprove the resubmitted ordinance. Any resubmitted ordinance shall become effective upon approval. Should the Commission disapprove the resubmitted ordinance, it shall promptly resubmit the ordinance for reconsideration. Should the Commission fail to act within sixty days, the ordinance shall be deemed to be approved.

(c) Commission land use ordinances

(1) Within ninety days after making a determination that a county has failed to comply with the provisions of this section, the Commission shall make and publish a land use ordinance setting standard for the use of non-Federal lands in such county within the boundaries of the national scenic area, excluding urban areas identified in section 544b(e) of this title. The ordinance shall have the object of assuring that the use of such non-Federal lands is consistent with the management plan. The ordinance may differ amongst the several parcels of land within the boundaries of the scenic area. The ordinance may from time to time be amended by the Commission.

(2) Subsequent Compliance. – In the event the Commission has promulgated regulations pursuant to this section, a county may thereafter upon written notice to the Commission elect to adopt a land use ordinance, in which event it shall comply with the provisions of this section for adoption of a land use ordinance. Upon approval of a land use ordinance by the Commission it shall supersede any regulations for the county developed by the Commission, subject to valid existing rights.

(d) Construction of facilities. The Secretary is hereby authorized to design, construct, operate and maintain such facilities as are included in the recreation assessment.

(Pub. L. 99-663, Sec. 7, Nov. 17, 1986, 100 Stat. 4282.)

§ 544f **Sec. 8. Administration of special management areas**

(a) Administration of Federal lands

(1)[3] The Secretary shall administer Federal lands within the special management areas in accordance with sections 544 to 544p of this title and other laws, rules and regulations applicable to the national forest system. In addition, the construction of roads and the management, utilization and harvest of timber on Federal lands within the special management areas also shall be subject to Forest Service visual resource management guidelines. The Secretary shall utilize lands acquired through exchange in calculating the allowable sales quantity on the Gifford Pinchot and Mount Hood National Forests.

(b) Withdrawal of Federal lands. Subject to valid existing rights, all Federal lands located in the special management areas are hereby withdrawn from all forms of entry, appropriation, or disposal under the public land laws, from location, entry, and patent under the mining laws of the United States, and from disposition under all laws pertaining to mineral and geothermal leasing: Provided, That the Secretary may allow the exploration, development, or production of sand, gravel, and crushed rock as necessary to construct, maintain, or reconstruct roads in the special management areas.

(c) Resource inventory. The Secretary shall complete a resource inventory for the special management areas consistent with the process and substance of the inventory prescribed by section 544d(a)(1) of this title.

(d) Recreation assessment. Within two years after November 17, 1986, the Secretary shall complete an assessment of recreation resources in the special management areas and opportunities for enhancement of these resources. The recreation assessment shall –

(1) identify areas within the special management areas suitable for designation by the Commission pursuant to section 544d of this title for the construction of an interpretive center or other appropriate facility, to be located in the State of Oregon, and of a conference center or other appropriate facility, to be located in the State of Washington;

(2) identify areas within the special management areas suitable for other public use facilities, including but not limited to educational and interpretive facilities, campsites, picnic areas, boat launch facilities, and river access areas; and

(3) subject to the treaty or other rights of Indian tribes, identify areas with the special management areas suitable for use to increase access for recreation purposes to the Columbia River and its tributaries.

(e) Land use designations. Within three years after November 17, 1986, the Secretary shall develop land use designations for the special management areas. The land use designations shall be -(1) based on the resource inventory prepared by the Secretary pursuant to this section; and (2) consistent with the standards established in section 544d of this title.

(f) Guidelines for land use ordinances

(1)[4] Within three years after November 17, 1986, the Secretary shall, in consultation with the Commission, develop guidelines to assure that non-Federal lands within the special management areas are managed consistent with the standards

[3] So in original. No par. (2) has been enacted.

[4] So in original. No par. (2) has been enacted.

in section 544d of this title and the purposes of sections 544 to 544p of this title. The Secretary shall promptly transmit the guidelines to the Commission for inclusion in the management plan. The guidelines shall require that management, utilization, and disposal of timber, and exploration, development, and production of sand, gravel, and crushed rock for the construction, maintenance, or reconstruction of roads used to manage or harvest forest products on non-Federal lands within the special management areas take place without adversely affecting the scenic, cultural, recreation, and natural resources of the scenic area.

(h)[5] Adoption of special management area land use ordinances

(1) Within sixty days of receipt of the management plan, each county shall submit to the Commission a letter stating that it proposes to adopt a land use ordinance consistent with the management plan. If any county fails to submit a letter as provided in this subsection, or fails to adopt a land use ordinance as provided in this section, the Commission shall carry out the requirements of subsection (l) of this section.

(2) Within two hundred seventy days of receipt of the management plan, each county shall adopt a special management area land use ordinance consistent with the management plan, and thereafter may adopt an amendment, revision or variance to a land use ordinance at any time. Each county upon adoption of a special management area land use ordinance shall promptly submit the adopted ordinance to the Commission.

(i) Review by Commission

(1) The Commission shall review the special management area land use ordinance received from each county, and within ninety days after receipt shall make a tentative determination as to whether the ordinance is consistent with the management plan. If the Commission makes a tentative determination that the land use ordinance is consistent with the management plan, the Commission shall send the ordinance to the Secretary for concurrence.

(2) If the Commission makes a tentative determination that the land use ordinance is inconsistent with the management plan, the Commission shall state the reasons for the determination and shall return the ordinance to the appropriate county with suggested modifications required for consistency with the management plan.

(3) Each county shall have ninety days after it is notified by the Commission to make modifications designed to eliminate the inconsistencies and to resubmit the ordinance to the Commission for tentative determination of consistency. The Commission shall have sixty days to make a tentative consistency determination on the resubmitted ordinance. If found consistent, the land use ordinance shall be transmitted by the Commission to the Secretary for concurrence that the ordinance is consistent with the management plan. If the Commission finds the resubmitted ordinance inconsistent, the Commission shall adopt an ordinance pursuant to subsection (l) of this section.

(j) Concurrence by Secretary

(1) Upon receipt of a special management area land use ordinance from the Commission, the Secretary shall notify the public of such receipt and shall,

[5] So in original. No subsec. (g) has been enacted.

within ninety days thereafter, concur with the Commission's tentative determination of consistency with the management plan unless the Secretary determines the ordinance is inconsistent. Any ordinance submitted to the Secretary shall become effective upon notification of concurrence. Should the Secretary fail to act within ninety days, the Secretary shall be deemed to have concurred with the Commission's tentative consistency determination.

(2) Denial of Concurrence. - If concurrence is denied, the Secretary shall state the reasons therefor and shall submit to the Commission suggested modifications to the land use ordinances to make them consistent with the management plan and the purposes of sections 544 to 544p of this title.

(k) Commission reconsideration. Upon receipt of notification of nonconcurrence by the Secretary, the Commission shall resubmit the land use ordinance to the appropriate county. Such county shall within ninety days, reconsider and revise the ordinance and resubmit the ordinance to the Commission for reconsideration in accordance with the provisions of this section. Should the Secretary again deny concurrence, the Commission shall either prepare a land use ordinance for such county pursuant to subsection (l) of this section or, by a two-thirds vote of the membership of the Commission including a majority of the members appointed from each State, determine that the ordinance is consistent with the management plan.

(l) Commission ordinances

(1) Within ninety days after making a determination that a county has failed to comply with the provisions of subsection (h) of this section, the Commission shall make and publish an ordinance setting standards for the use of non-Federal lands of such county within the boundaries of the special management areas. The ordinances shall have the object of assuring that the use of such lands is consistent with the management plan. The ordinances may differ amongst the several parcels of land within the boundaries of the special management areas. The ordinances may from time to time be amended by the Commission.

(2) The Commission shall promptly submit the ordinance to the Secretary. The Secretary shall, within ninety days after receipt of the ordinance from the Commission, concur with the tentative determination that the land use ordinance is consistent with the management plan unless a determination of inconsistency is made Any ordinance submitted to the Secretary shall become effective upon concurrence. Should the Secretary fail to concur within ninety days, the land use ordinance shall be effective.

(3) If concurrence is denied, the Secretary shall state the reasons for finding the ordinance is inconsistent with the management plan, and shall submit to the Commission suggested modifications to the ordinance to make it consistent with the plan.

(4) The Commission shall have ninety days after it receives recommendations from the Secretary to make modifications designed to eliminate the inconsistencies and to resubmit the ordinance to the Secretary for concurrence. The Secretary shall have sixty days to concur with the resubmitted ordinance. Any resubmitted ordinance shall become effective upon concurrence by the Secretary. Should the Secretary deny concurrence for the resubmitted ordinance, the Secretary shall state the reasons therefor and shall promptly

resubmit the ordinance for reconsideration. Should the Secretary fail to concur within sixty days, the ordinance shall be deemed effective.

(5) Within one hundred twenty days after receipt of notification of non-concurrence, the Commission shall –

(A) revise and resubmit the land use ordinance to the Secretary; or

(B) by a vote of two-thirds of its membership, including a majority of the members appointed from each State, reject the suggested modifications of the Secretary and adopt a land use ordinance consistent with the provisions of this section and the purposes of sections 544 to 544p of this title.

(m) Subsequent compliance. In the event the Commission has adopted an ordinance pursuant to this section, the affected county may thereafter, upon written notice to the Commission and to the Secretary, elect to adopt a special management area land use ordinance, in which event it shall comply with the provisions of this section for adoption of special management area land use ordinances. Upon concurrence of such land use ordinances by the Secretary they shall supersede any special management area land use ordinances for the county development by the Commission, subject to valid existing rights.

(n) Effect of Secretary's non-concurrence. If the Secretary does not concur in any land use ordinance approved or adopted by the Commission pursuant to this section, the availability of certain funds to the relevant county shall be governed by section 544n(c) of this title.

(o) Special rules

(1) In general – Any ordinance adopted pursuant to this section shall not apply to any parcel or parcels of land within a special management area if, after the date such ordinance has been adopted, three years have elapsed after a landowner has made a bona fide offer to sell at fair market value or otherwise convey such parcel or parcels to the Secretary, unless the affected landowner agrees to an extension of the three year period: Provided, That an offer shall not be considered bona fide if the landowner refuses consideration equal to the fair market value as appraised in accordance with section 544g(e) of this title. Lands for which an ordinance is suspended pursuant to this subsection shall be subject to the relevant scenic area land use ordinance adopted pursuant to section 544e of this title.

(2) Applicability – This subsection shall not apply to any land offered to the Secretary for acquisition after March 31, 2001.

(Pub. L. 99-663, Sec. 8, Nov. 17, 1986, 100 Stat. 4283; Pub. L. 06-291, title III, Sec. 346(b), Oct. 11, 2000, 114 Stat. 999.)

§ 544g Sec. 9. Land acquisition

(a) Acquisition authorized

(1) The Secretary is authorized to acquire any lands or interests therein within the special management areas and the Dodson/Warrendale Special Purchase Unit which the Secretary determines are needed to achieve the purposes of sections 544 to 544p of this title: Provided, That any lands, waters, or interests therein owned by either State or any political subdivision thereof may be acquired only by donation or exchange.

(2) Lands within the State of Oregon acquired by the Secretary pursuant to sections 544 to 544p of this title shall become part of the Mount Hood National Forest. Lands within the State of Washington acquired by the Secretary pursuant to this section shall become part of the Gifford Pinchot National Forest. All lands acquired by the Secretary pursuant to sections 544 to 544p of this title shall be subject to the laws and regulations pertaining to the National Forest System and sections 544 to 544p of this title.

(b) Limitations on eminent domain

(1) Where authorized in subsection (a) of this section to acquire land or interests therein without the consent of the owner, the Secretary shall –

(A) acquire only such land or interests therein as is reasonably necessary to accomplish the purposes of sections 544 to 544p of this title; and

(B) do so only in cases where all reasonable efforts to acquire with the consent of the owner such lands, or interests therein, have failed.

(2) Notwithstanding the provisions of subsection (a) of this section, the Secretary may not acquire without the consent of the owner lands or interests therein which –

(A) on November 17, 1986, were used primarily for educational, religious, or charitable purposes, single-family residential purposes, farming, or grazing so long as the existing character of that use is not substantially changed or permitted for change;

(B) are located in counties with land use ordinances in which the Secretary has concurred pursuant to section 544f of this title, unless such lands are being used, or are in imminent danger of being used, in a manner incompatible with such ordinances;

(C) are within the boundaries of the Dodson/Warrendale Special Purchase Unit; or

(D) are owned by an Indian tribe, held in trust by the United States for an Indian tribe or member of an Indian tribe, or otherwise administered by the United States for the benefit of an Indian tribe or member of an Indian tribe.

(c) Hardship cases. In exercising authority to acquire lands pursuant to this section the Secretary shall give prompt and careful consideration to any offer made by any person or entity owning any land, or interest in land, within the boundaries of a special management area. In considering such offer, the Secretary shall take into consideration any hardship to the owner which might result from any undue delay in acquiring the property.

(d) Land exchanges

(1) The Secretary is authorized and directed, in conformance with the provisions of this subsection, to acquire by exchange any parcel of unimproved forest land at least forty acres in size within the boundaries of the special management areas which is owned by any private forest land owner if, after November 17, 1986, but within one hundred and eighty days after final adoption of the management plan, such private forest land owner offers to the United States such parcel of forest land.

(2) In exercising this authority to acquire forest lands pursuant to this subsection, the Secretary may accept title to such lands and convey to the owner federally owned lands deemed appropriate by the Secretary within the States of Oregon

and Washington, regardless of the State in which the transferred lands are located. Forest lands exchanged pursuant to this subsection shall be of approximately equal value: Provided, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize minor differences in the values of the properties exchanged: Provided further, That the Secretary may reserve in any conveyance pursuant to this subsection such easements, subsurface rights, and any other interests in land deemed necessary or desirable: Provided further, That the valuation of lands exchanged shall be determined in terms of forest uses for timber.

(3) It is the intention of Congress that land exchanges pursuant to this subsection shall be completed no later than five years after November 17, 1986.

(4) In the event that exchanges authorized by this section leave any private forest land owner with ownership of an uneconomic remnant of forest land contiguous to a special management area, the Secretary is authorized to acquire such forest lands as if they were within the boundaries of a special management area.

(5) The following-described Federal lands and interests therein are hereby identified as candidate lands for exchanges conducted pursuant to this section: Provided, That the determination of which candidate lands will be exchanged, and in what sequence, shall be at the discretion of the Secretary. Subject to valid existing rights, such lands are hereby withdrawn from all forms of entry or appropriation or disposal under the public land laws, and from location, entry, and patent under the United States mining law, and from disposition under all laws pertaining to mineral and geothermal leasing and all amendments thereto until the Secretary determines such lands are no longer needed to complete exchanges authorized by this section: Provided, That such period shall not extend beyond five years:

GIFFORD PINCHOT NATIONAL FOREST

Wind River-Panther Creek Area

Section	Township	Range
35	4N	7E
36	4N	7E

Approx. 430 acres.

South Swift Area

Section	Township	Range
13	6N	5E
23	6N	5E
17	6N	6E
18	6N	6E

Approx. 1,920 acres.

Buck Creek-Willard Area

Section	Township	Range
16	3N	9E

1	4N	9E
2	4N	9E
3	4N	9E
10	4N	9E
11	4N	9E
12	4N	9E
15	4N	9E
21	4N	9E
22	4N	9E
26	4N	9E
27	4N	9E
28	4N	9E
29	4N	9E
30	4N	9E
31	4N	9E
32	4N	9E
33	4N	9E
34	4N	9E
35	4N	9E
6	4N	10E
7	4N	10E
5	5N	10E
6	5N	10E
7	5N	10E
8	5N	10E
9	5N	10E
30	5N	10E
31	5N	10E
32	5N	10E

Approx. 14,460 acres.

National Area

Section	Township	Range
6	14N	7E
7	14N	7E
18	14N	7E
30	14N	7E

Approx. 2,560 acres.

SIUSLAW NATIONAL FOREST

East Beaver Area

Section	Township	Range
33	2S	9W
34	2S	9W
2	3S	9W
3	3S	9W
4	3S	9W
8	3S	9W
9	3S	9W
17	3S	9W

Approx. 3,053 acres.

WILLAMETTE NATIONAL FOREST

Ida-McCoy Area

Section	Township	Range
21	10S	6E
28	10S	6E

Approx. 680 acres.

MOUNT HOOD NATIONAL FOREST

Estacada Area

Section	Township	Range
15	10S	5E

Approx. 560 acres.

Zig-Zag Area

Section	Township	Range
22	2S	7E
29	2S	7E

Approx. 280 acres.

Hood River Area

Section	Township	Range
4	1N	9E
36	1N	10E
31	1N	11E
2	1S	9E
3	1S	9E
4	1S	9E
5	1S	9E
6	1S	9E

Approx. 5,800 acres.

(e) Appraisals

(1) Definition of landowner – In this subsection, the term "landowner" means the owner of legal or equitable title as of September 1, 2000.

(2) Appraisal standards – Except as provided in paragraph (3), land acquired or conveyed by purchase or exchange under this section shall be appraised in conformity with the Uniform Appraisal Standards for Federal Land Acquisitions.

(3) Special management areas

(A) Before April 1, 2001 – Land within a special management area for which the landowner, before April 1, 2001, makes a written bona fide offer to convey to the Secretary for fair market value shall be appraised –

(i) without regard to the effect of any zoning or land use restriction made in response to sections 544 to 544p of this title; but

(ii) subject to any other current zoning or land use restriction imposed by the State or locality in which the land is located on the date of the offer.

(B) On or after April 1, 2001 – Land within a special management area for which the landowner, on or after April 1, 2001, makes a written bona fide offer to convey to the Secretary for fair market value shall be appraised subject to –

(i) any zoning or land use restriction made in response to sections 544 to 544p of this title; and

(ii) any other current zoning or land use restriction that applies to the land on the date of the offer.

(f) Authorization for certain land exchanges

(1) In general. To facilitate priority land exchanges through which land within the boundaries of the White Salmon Wild and Scenic River or within the scenic area is conveyed to the United States, the Secretary may accept title to such land as the Secretary determines to be appropriate within the States, regardless of the State in which the land conveyed by the Secretary in exchange is located, in accordance with land exchange authorities available to the Secretary under applicable law.

(2) Special rule for land certain exchanges. Notwithstanding any other provision of law –

(A) any exchange described in paragraph (1) for which an agreement to initiate has been executed as of September 30, 2000, shall continue; and

(B) any timber stumpage proceeds collected under the exchange shall be retained by the Forest Service to complete the exchange.

(g) Boundaries. For the purposes of section 4601-9 of this title, the boundaries of the scenic area, including special management areas and the Dodson/Warrendale Special Purchase Unit shall be treated as if they were within the boundaries of the Mount Hood or Gifford Pinchot National Forests as of January 1, 1965.

(Pub. L. 99-663, Sec. 9, Nov. 17, 1986, 100 Stat. 4287; Pub. L. 104-66, title I, Sec. 1011(n), Dec. 21, 1995, 109 Stat. 710; Pub. L. 106-291, title III, Sec. 346(a), Oct. 11, 2000, 114 Stat. 999.)

§ 544h **Sec. 10. Interim management**

(a) Interim guidelines

(1)[6] Within one hundred eighty days after November 17, 1986, the Secretary shall develop interim guidelines for the scenic area outside urban areas to identify land use activities which are inconsistent with sections 544 to 544p of this title and to govern the authority to acquire land without the consent of the owner provided by subsection (b) of this section. The Secretary shall promptly notify the public of adoption of the interim guidelines and transmit the guidelines to each county. Guidelines adopted by the Secretary pursuant to this subsection shall remain in effect for each county until the Secretary has developed guidelines for the special management areas pursuant to section 544f of this title and the land use ordinances prescribed by section 544e of this title are in effect.

[6] So in original. No par. (2) has been enacted.

(b) Interim acquisition authority and injunctive relief. Prior to the concurrence by the Secretary of land use ordinances prescribed by section 544f of this title and the approval by the Commission of land use ordinances prescribed by section 544e of this title, the following authorities are granted:

(1) The Secretary may acquire by condemnation any land or interest which is being used or threatened to be used in a manner inconsistent with the purposes for which the scenic area was established and which will cause or is likely to cause impacts adversely affecting the scenic, cultural, recreation, and natural resources of the scenic area: Provided, That no lands or interests therein can be acquired by condemnation pursuant to this section if used in the same manner and for the same purposes as used on November 17, 1986, unless such land is used for or interest is in the development of sand, gravel, or crushed rock, or the disposal of refuse: Provided further, That within thirty days of the filing by the Secretary of a complaint for condemnation of any land or interest in the scenic area, outside of the special management areas and urban areas, the Commission, by a vote of two-thirds of its membership including a majority of the members appointed from each State, or if the Commission is not in existence the Governor of the State in which the land or interest is located, may disapprove such proposed complaint.

(2) Upon or after the commencement of any action for condemnation pursuant to this subsection, the Secretary, acting through the Attorney General of the United States, may apply to the appropriate United States District Court for a temporary restraining order or injunction to prohibit the use of any property within the scenic area, but outside of urban areas, which will cause or is likely to cause impacts adversely affecting the scenic, cultural, recreation and natural resources of the scenic area or is otherwise inconsistent with the purposes for which the scenic area was established. During the period of such order or injunction, the Secretary shall diligently and in good faith negotiate with the owner of the property to assure that, following termination of the order or injunction, the inconsistent use is abated or the adverse effect is mitigated.

(c) Review of development action. Prior to the effective date of a land use ordinance for each county pursuant to section 544e of this title, and concurrence of the Secretary on a land use ordinance for each county pursuant to section 544f of this title, the Commission shall review all proposals for major development actions and new residential development in such county in the scenic area, except urban areas. The Commission shall allow major development actions and new residential development only if it determines that such development is consistent with the standards contained in section 544d of this title and the purposes of sections 544 to 544p of this title.

(Pub. L. 99-663, Sec. 10, Nov. 17, 1986, 100 Stat. 4291.)

§ 544i **Sec. 11. Economic development**

(a) Economic development plan. Based on the Economic Opportunity Study and other appropriate information, each State, in consultation with the counties and the Commission, shall develop a plan for economic development projects for which grants under this section may be used in a manner consistent with sections 544 to 544p of this title.

(b) Funds provided to States for grants. Upon certification of the management plan, and receipt of a plan referred to in subsection (a) of this section, the Secretary shall

provide $5,000,000 to each State which each State shall use to make grants and loans for economic development projects that further the purposes of sections 544 to 544p of this title.

(c) Conditions of grants. Each State making grants under this section shall require as a condition of a grant that –

(1) all activities undertaken under the grant are certified by the Commission as being consistent with the purposes of sections 544 to 544p of this title, the management plan, and land use ordinances adopted pursuant to sections 544 to 544p of this title;

(2) grants and loans are not used to relocate a business from one community to another;

(3) grants and loans are not used for program administration; and

(4) grants and loans are used only in counties which have in effect land use ordinances found consistent by the Commission and concurred on by the Secretary pursuant to section 544f of this title.

(d) Report. Each State shall –

(1) prepare and provide the Secretary with an annual report to the Secretary on the use of the funds made available under this section;

(2) make available to the Secretary and to the Commission, upon request, all accounts, financial records, and other information related to grants and loans made available pursuant to this section; and

(3) as loans are repaid, make additional grants and loans with the money made available for obligation by such repayments.

(Pub. L. 99-663, Sec. 11, Nov. 17, 1986, 100 Stat. 4292.)

§ 544j **Sec. 12. Old Columbia River Highway**

The Oregon Department of Transportation shall, in consultation with the Secretary and the Commission, the State of Oregon and the counties and cities in which the Old Columbia River Highway is located, prepare a program and undertake efforts to preserve and restore the continuity and historic integrity of the remaining segments of the Old Columbia River Highway for public use as a Historic Road, including recreation trails to connect intact and usable segments.

(Pub. L. 99-663, Sec. 12, Nov. 17, 1986, 100 Stat. 4293.)

§ 544k **Sec. 13. Tributary rivers and streams**

(a) Water resources projects. The following rivers and streams shall be subject to the same restrictions on the licensing, permitting, and exempting from licensing and the construction of water resource projects as provided for components of the National Wild and Scenic Rivers System pursuant to section 7(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1278(a)):

(1) any tributary river or stream to the Columbia River not designated in subsections[7] (c) or (d) of this section or otherwise specified in this subsection which flows in whole or in part through a special management area, unless the construction of a water resources project would not have a direct and adverse effect on the scenic, cultural, recreation, and natural resources of the scenic area;

[7] So in original. Probably should be "subsection".

(2) any river or river segment which flows in whole or in part through the scenic area and which is established pursuant to State law as a wild, scenic, or recreation river or which is under study pursuant to State law for the potential inclusion in any such State protected river system, unless such project or projects meet terms and conditions set by State agencies exercising administration over such river or river segment;

(3) the Wind River, Washington, for a period not less than three years following the later of –

(A) final approval of the Gifford Pinchot National Forest Plan, adopted pursuant to the National Forest Management Act of 1976 (Act of October 22, 1976, Public Law 94-588, as amended) (16 U.S.C. 1600 et seq.); or

(B) submittal by the Secretary of a report to the President on the suitability or nonsuitability for addition to the national wild and scenic rivers system and a report by the President to the Congress of recommendations and proposals with respect to the designation of such river under the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.);

(4) the Hood River, Oregon, for a period not to exceed twenty years from November 17, 1986, if such facility impounds or diverts water other than by means of a dam or diversion existing as of November 17, 1986; and

(5) the segment of the Little White Salmon, Washington, from the Willard National Fish Hatchery to its confluence with the Columbia River if such facility impounds or diverts water other than by means of a dam or diversion existing as of November 17, 1986.

(b) Exceptions. The provisions of subsection (a) of this section shall not apply to those portions of tributary rivers or streams to the Columbia River which flow through or border on Indian reservations. Nothing in this section shall apply to or affect any segment of any river designated as a wild and scenic river under section 3 of the Wild and Scenic Rivers Act (16 U.S.C. 1274) or any river designated for study under section 5 of such Act (16 U.S.C. 1276).

(Pub. L. 99-663, Sec. 13(a), (b), Nov. 17, 1986, 100 Stat. 4293, 4294.)

§ 544l Sec. 14. Implementation measures

(a) Assistance to counties. The Secretary shall provide technical assistance on a nonreimbursable basis to counties for the development of land use ordinances prescribed by sections 544e and 544f of this title: Provided, That in the event a county fails to obtain approval by the Commission for a land use ordinance within three years after the date technical assistance is first provided under this subsection for the development of a land use ordinance, the Secretary shall terminate all technical assistance for any participation in the development of such ordinance.

(b) Payment of timber receipts

(1) Notwithstanding the provisions of section 500 of this title, that portion of which is paid under such provisions to the State of Oregon with respect to the special management areas within the Mount Hood National Forest, the Gates of the Columbia Gorge Special Management Area, Mount Hood National Forest, and to the State of Washington with respect to the special management areas within the Gifford Pinchot National Forest –

(A) not less than 50 per centum shall be expended for the benefit of the public schools of the county which has adopted implementation measures pursuant to sections 544 to 544p of this title; and

(B) the remainder shall be expended for the benefit of public roads or any public purposes of any county which has adopted implementation measures pursuant to sections 544 to 544p of this title.

(2) Paragraph (1) of this subsection shall not apply –

(A) to any amount paid by the Secretary of the Treasury under the provisions of law referred to in subsection (b)(1) of this section at the end of any fiscal year ending before November 17, 1986; or

(B) for a particular county, if the county does not have in effect a land use ordinance which has been found consistent by the Commission and concurred on by the Secretary pursuant to section 544f of this title.

(c) Payments to local governments

(1) Subject to section 544n(b) of this title, in the case of any land or interest therein acquired by the Secretary pursuant to section 544g of this title, which was subject to local real property taxes within the five years preceding such acquisition and which is located in a county which has in effect a land use ordinance which has been found consistent by the Commission and concurred on by the Secretary pursuant to section 544f of this title, the Secretary is authorized and directed to make annual payments to the county in which such lands are located in an amount equal to 1 per centum of the fair market value of such land or interest therein on the date of acquisition by the Secretary.

(2) Notwithstanding paragraph (1) of this subsection, any payment made for any fiscal year to a county pursuant to this subsection shall not exceed the amount of real property taxes assessed and levied on such property during the last full fiscal year before the fiscal year in which such land or interest therein was acquired by the Secretary.

(3) Limitation.

(A) In general. - Except as provided in subparagraph (B), no payment shall be made under this subsection with respect to any land or interest therein after the eighth full fiscal year beginning after the first fiscal year in which such a payment was made with respect to such land or interest therein.

(B) Continuation of certain payments. - For any land or interest in land for which the Secretary is making a payment in fiscal year 2000, such payment shall be continued for a total of eight fiscal years.

(d) Federal consistency. Except as otherwise provided in subsection (e) of this section or in section 544o of this title, Federal agencies having responsibilities within the scenic area shall exercise such responsibilities consistent with the provisions of sections 544 to 544p of this title as determined by the Secretary.

(e) Limitations on Federal expenditures affecting the scenic area

(1) Except as provided in paragraph (3), if the Commission has not been established pursuant to section 544c of this title within fifteen months after November 17, 1986, or is otherwise disestablished for any reason, no new expenditures or new financial assistance may be made available, and no new license or new permit, or exemption from a license or permit requirement, shall be issued, under authority of any Federal law for any activity within the scenic

area, excluding urban areas, which the Secretary,[8] determines is inconsistent with any implementation measure pursuant to, the standards established in section 544d(b) of this title, or the purposes of sections 544 to 544p of this title.

(2) (A) (i) An expenditure or financial assistance made available under authority of Federal law shall be treated, for purposes of this subsection, as a new expenditure or new financial assistance if –

(I) in any case with respect to which specific appropriations are required, no money for construction or purchase was appropriated before October 1, 1986; or

(II) no legally binding commitment for the expenditure or financial assistance was made before October 1, 1986.

(ii) Payments made to the State pursuant to the following Acts shall not be treated as an expenditure or financial assistance for purposes of this subsection: section 500 of this title; the Mineral Lands Leasing Act of 1920 (30 U.S.C. 181 et seq.); chapter 69 of title 31 (relating to payments in lieu of taxes for entitlement land); the Act of June 9, 1916 (39 Stat. 218), and the Act of Feb. 26, 1919 (40 Stat. 1179).

(B) A license or permit, or exemption from a license or permit requirement, shall be treated, for purposes of this subsection, as a new license or new permit, or exemption from a license or permit requirement, if such license or permit, or exemption from a license or permit requirement, was issued on or after October 1, 1986. A renewal under similar terms and conditions of a license or permit, or exemption from a license or permit requirement, issued before October 1, 1986, shall not be treated as a new license or new permit, or exemption from a license or permit requirement.

(3) Notwithstanding paragraph (1), the appropriate Federal officer, after consultation with the Secretary, may make Federal expenditures or financial assistance available within the area for any of the following:

(A) The maintenance of existing channel improvements and related structures, and including the disposal of dredge materials related to such improvements.

(B) The maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or publicly operated roads, structures, or facilities that are essential links in a larger network or system.

(C) Military activities essential to national security.

(D) Any of the following actions or projects, but only if the making available of expenditures or assistance therefor is consistent with the standards in section 544d(b) of this title and the purposes of sections 544 to 544p of this title:

(i) Projects for the study, management, protection and enhancement of fish and wildlife resources and habitats, including, but not limited to, acquisition of fish and wildlife habitats and related lands, stabilization projects for fish and wildlife habitats, and recreational projects.

(ii) The establishment, operation, and maintenance of air and water navigation aids and devices, and for access thereto.

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[8] So in original. The comma probably should not appear.

(iii) Projects under the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460l-4 through 11) and the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.).

(iv) Scientific research, including but not limited to aeronautical, atmospheric, space, geologic, marine, fish and wildlife, and other research, development, and applications.

(v) Assistance for emergency actions essential to the saving of lives and the protection of property and the public health and safety, if such actions are performed pursuant to sections 305 and 306 of the Disaster Relief Act of 1974 (42 U.S.C. 5145 and 5146) and section 1362 of the National Flood Insurance Act of 1968 (42 U.S.C. 4103) and are limited to actions that are necessary to alleviate the emergency.

(vi) The maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or publicly operated roads, structures, or facilities. This clause shall not apply to roads, structures, or facilities referred to in paragraph (3)(B).

(vii) Nonstructural projects for shoreline stabilization that are designed to mimic, enhance, or restore natural stabilization systems.

(4) The Director of the Office of Management and Budget shall, on behalf of each Federal agency concerned, make written certification that each such agency has complied with the provisions of this subsection during each fiscal year beginning after September 30, 1987. Such certification shall be submitted on an annual basis to the House of Representatives and the Senate pursuant to the schedule required under the Congressional Budget and Impoundment Control Act of 1974.

(5) Nothing contained in this subsection shall be construed as indicating an intent on the part of the Congress to change the existing relationship of other Federal laws to the law of a State, or a political subdivision of a State, or to relieve any person or any obligation imposed by any law of any State, or political subdivision of a State. No provision of this subsection shall be construed to invalidate any provision of State or local law unless there is a direct conflict between such provision and the law of the State, or political subdivision of the State, so that the two cannot be reconciled or consistently stand together. This subsection shall in no way be interpreted to interfere with a State's right to protect, rehabilitate, preserve, and restore lands within its established boundary.

(f) Transfer of public lands. Subject to valid existing rights, all public lands within the scenic area administered by the Secretary of the Interior through the Bureau of Land Management are hereby transferred without consideration to the jurisdiction of the Secretary to be managed as National Forest lands in accordance with the provisions of sections 544 to 544p of this title.

(Pub. L. 99-663, Sec. 14, Nov. 17, 1986, 100 Stat. 4294; Pub. L. 106-291, title III, Sec. 346(e), Oct. 11, 2000, 114 Stat. 1000.)

§ 544m Sec. 15. Enforcement

(a) Administrative remedies

(1) Commission orders. The Commission shall monitor activities of counties pursuant to sections 544 to 544p of this title and shall take such actions as it determines are necessary to ensure compliance.

(2) Appeal to the Commission. Any person or entity adversely affected by any final action or order of a county relating to the implementation of sections 544 to 544p of this title may appeal such action or order to the Commission by filing with the Commission within thirty days of such action or order, a written petition requesting that such action or order be modified, terminated, or set aside.

(3) Civil penalties. Any person or entity who willfully violates the management plan or any land use ordinance or any implementation measure or any order issued by the Commission pursuant to sections 544 to 544p of this title may be assessed a civil penalty by the Commission not to exceed $10,000 for each violation. No penalty may be assessed under this subsection unless such person or entity is given notice and opportunity for a public hearing with respect to such violation. The Commission may compromise, modify, or remit,with or without conditions, any penalty imposed under this subsection, taking into consideration the nature and seriousness of the violation and the efforts of the violator to remedy the violation in a timely manner.

(b) Judicial remedies

(1) Civil actions to enforce sections 544 to 544p of this title

(A) Except as otherwise limited by sections 544 to 544p of this title, the Attorney General of the United States may, at the request of the Secretary, institute a civil action for an injunction or other appropriate order to prevent any person or entity from utilizing lands within the special management areas in violation of the provisions of sections 544 to 544p of this title, interim guideline adopted or other action taken by the Secretary pursuant to sections 544 to 544p of this title.

(B) The Commission, or, at the request of the Commission, or the attorney general of Oregon or Washington, may institute a civil action for an injunction or other appropriate order to prevent any person or entity from utilizing lands within the scenic area outside urban areas in violation of the provisions of sections 544 to 544p of this title, the management plan, or any land use ordinance or interim guideline adopted or other action taken by the Commission or any county pursuant to sections 544 to 544p of this title.

(2) Citizens suits. Any person or entity adversely affected may commence a civil action to compel compliance with sections 544 to 544p of this title -

(A) against the Secretary, the Commission or any county where there is alleged a violation of the provisions of sections 544 to 544p of this title, the management plan or any land use ordinance or interim guideline adopted or other action taken by the Secretary, the Commission, or any county pursuant to or Commission[9] under sections 544 to 544p of this title; or

[9] So in original. The word "Commission" probably should not appear.

(B) against the Secretary, the Commission, or any county where there is alleged a failure of the Secretary, the Commission or any county to perform any act or duty under sections 544 to 544p of this title which is not discretionary with the Secretary, the Commission or any county.

(3) Limitation on bringing of citizens suits. No action may be commenced -

(A) under paragraph (2)(A) of this subsection –

(i) prior to sixty days after the plaintiff has given notice in writing of the alleged violation to the Secretary, to the Commission, and to the county in which the violation is alleged to have occurred; or

(ii) if the Attorney General of the United States, or the attorney general of Oregon or Washington, has commenced and is diligently prosecuting a civil action on the same matter pursuant to paragraph (1) of this subsection to require compliance with the management plan or any regulations, guidelines, or standards issued or other actions taken by the Secretary, the Commission, or any county pursuant to sections 544 to 544p of this title: Provided, That in any such action any person or entity otherwise entitled to bring an action pursuant to paragraph (2) of this subsection may intervene as a matter of right; or

(iii) which challenges the consistency of the draft management plan with the purposes and standards of sections 544 to 544p of this title or with other applicable law prior to the certification or adoption of the Management Plan pursuant to section 544d of this title; or

(B) under paragraph (2)(B) of this subsection prior to sixty days after the plaintiff has given notice in writing of such action to the Secretary, the Commission, and to the county in which the failure to perform any act or duty pursuant to sections 544 to 544p of this title is alleged: Provided, That such action may be brought immediately after such notification where the violation or order complained of constitutes an imminent threat to the health or safety of the plaintiff or would immediately affect a legal interest of the plaintiff.

(4) Judicial review. Any person or entity adversely affected by –

(A) any final action or order of a county, the Commission, or the Secretary relating to the implementation of sections 544 to 544p of this title;

(B) any land use ordinance or interim guideline adopted pursuant to sections 544 to 544p of this title;

(C) any appeal to the Commission pursuant to this section;

(D) any civil penalty assessed by the Commission pursuant to paragraph (a)(3) of this subsection may appeal such action or order by filing in any of the courts specified in paragraph (5) of this subsection, within sixty days after the date of service of such order or within sixty days after such action is taken, a written petition requesting such action, order, land use ordinance, interim guideline, or appeal taken to the Commission be modified, terminated, or set aside.

(5) Federal court jurisdiction. The United States district courts located in the States of Oregon and Washington shall have jurisdiction over –

(A) any criminal penalty imposed pursuant to section 551 of this title, or any other applicable law for violation of any order, regulation or other action taken by the Secretary pursuant to sections 544 to 544p of this title;
(B) any civil action brought against the Secretary pursuant to this section; or
(C) any appeal of any order, regulation, or other action of the Secretary taken pursuant to paragraph (4) of this subsection.

(6) State court jurisdiction. The State courts of the States of Oregon and Washington shall have jurisdiction –
(A) to review any appeals taken to the Commission pursuant to subsection (a)(2) of this section;
(B) over any civil action brought by the Commission pursuant to subsection (b)(1) of this section or against the Commission, a State, or a county pursuant to subsection (b)(2) of this section;
(C) over any appeal of any order, regulation, or other action of the Commission or a county taken pursuant to paragraph 4 of this subsection; or
(D) any civil penalties assessed by the Commission pursuant to subsection (a)(3) of this section.

(Pub. L. 99-663, Sec. 15, Nov. 17, 1986, 100 Stat. 4297.)

§ 544n Sec. 16. Authorization of appropriations

(a) General authorizations. There are authorized to be appropriated for fiscal years after the fiscal year 1986 such sums as are described below;[10]
(1) For the purpose of acquisition of lands, water and interests therein pursuant to sections 544 to 544p of this title: $40,000,000: Provided, That of this amount no more than $10,000,000 shall be available to acquire lands, water, and interests therein pursuant to section 544h of this title. Such amounts are authorized to be appropriated from amounts covered into the Land and Water Conservation Fund notwithstanding any allocation, apportionment, or limitation contained in the Land and Water Conservation Fund (16 U.S.C. 460l-4 and following).
(2) For the purpose of providing payments to local governments pursuant to section 544l(c) of this title: $2,000,000.

(b) Specific authorizations. There are authorized to be appropriated for fiscal years after the fiscal year 1986, effective upon concurrence on the management plan pursuant to section 544d of this title:
(1) For the purpose of construction of an interpretive center to be located in the State of Oregon, and a conference center to be located in the State of Washington: $10,000,000.
(2) For the purpose of construction of recreation facilities pursuant to section 544e(d) of this title: $10,000,000.
(3) For the purpose of preparing a program and restoring and reconstructing the Old Columbia River Scenic Highway, Oregon pursuant to section 544j of this title: $2,800,000.
(4) For the purpose of providing economic development grants pursuant to section 544i of this title: $5,000,000 for each State: Provided, That funds authorized to be appropriated pursuant to this paragraph shall be available for the acquisition

[10] So in original. The semicolon probably should be a colon.

of lands and interests therein pursuant to section 544h of this title if, at the expiration of three years, the States have failed to carry out their respective function pursuant to section 544c of this title.

(c) Availability of funds. Funds appropriated under subsections (a)(2) and (b) of this section shall not be made available for any county which does not have in effect a land use ordinance which has been found to be consistent by the Commission, and concurred on by the Secretary as consistent with the management plan pursuant to section 544f of this title.

(Pub. L. 99-663, Sec. 16, Nov. 17, 1986, 100 Stat. 4300.)

§ 544o Sec. 17. Savings provisions

(a) Nothing in sections 544 to 544p of this title shall –

(1) affect or modify any treaty or other rights of any Indian tribe;

(2) except as provided in section 13(c), authorize the appropriation or use of water by any Federal, State, or local agency, Indian tribe, or any other entity or individual;

(3) except as provided in section 13(c), affect the rights or jurisdictions of the United States, the States, Indian tribes or other entities over waters of any river or stream or over any ground water resource or affect or interfere with transportation activities on any such river or stream;

(4) except as provided in section 13(c), alter, establish, or affect the respective rights of the United States, the States, Indian tribes, or any person with respect to any water or water-related right;

(5) alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by the States before November 17, 1986;

(6) affect or modify the ability of the Bonneville Power Administration to operate, maintain, and modify existing transmission facilities;

(7) affect lands held in trust by the Secretary of the Interior for Indian tribes or individual members of Indian tribes or other lands acquired by the Army Corps of Engineers and administered by the Secretary of the Interior for the benefit of Indian tribes and individual members of Indian tribes;

(8) affect the laws, rules and regulations pertaining to hunting and fishing under existing State and Federal laws and Indian treaties;

(9) require any revision or amendment of any forest plan adopted pursuant to the National Forest Management Act of 1976 (Act of October 22, 1976, Public Law 94-588, as amended (16 U.S.C. 1600 et seq.)); or

(10) establish protective perimeters or buffer zones around the scenic area or each special management area. The fact that activities or uses inconsistent with the management directives for the scenic area or special management areas can be seen or heard from these areas shall not, of itself, preclude such activities or uses up to the boundaries of the scenic area or special management areas.

(b) Improvement of navigation facilities at Bonneville Dam. Except for the offsite disposal of excavation material, nothing in sections 544 to 544p of this title shall be construed to affect or modify the responsibility of the United States Army Corps of Engineers to improve navigation facilities at Bonneville Dam pursuant to Federal law.

(c) Rights and responsibilities of non-Federal timber land owners. Except for the management, utilization, or disposal of timber resources of non-Federal lands within the special management areas, nothing in sections 544 to 544p of this title shall affect the rights and responsibilities of non-Federal timber land owners under the Oregon and Washington Forest Practices Acts or any county regulations which under applicable State law supersede such Acts.

(d) Interstate compacts. Mandatory language in sections 544 to 544p of this title respecting the powers and responsibilities of the Commission shall be interpreted as conditions precedent to congressional consent to the interstate compact described in section 544c of this title.

(e) Failure to establish Columbia River Gorge Commission; responsibility of Secretary. In the event that the States of Washington and Oregon fail to comply with the provisions of section 544c of this title, the Secretary shall not be obligated to take actions which are predicated upon the establishment of the Commission.

(f) Actions of Secretary as major Federal actions affecting the environment

(1) Actions by the Secretary pursuant to subsections (f), (g), and (h) of section 544d of this title; subsections (f), (j), (k), and (l) of section 544f of this title; section 544g of this title; and subsections (a) and (b)(2) of section 544h of this title shall neither be considered major Federal actions significantly affecting the quality of the environment under section 102 of the National Environmental Policy Act (42 U.S.C. 4332) nor require the preparation of an environmental assessment in accordance with that Act (42 U.S.C. 4321 et seq.).

(2) Except as provided in paragraph (1) of this subsection, nothing in sections 544 to 544p of this title shall expand, restrict, or otherwise alter the duties of the Secretary under the National Environmental Policy Act.

(Pub. L. 99-663, Sec. 17, Nov. 17, 1986, 100 Stat. 4300.)

§ 544p **Sec. 18. Severability**

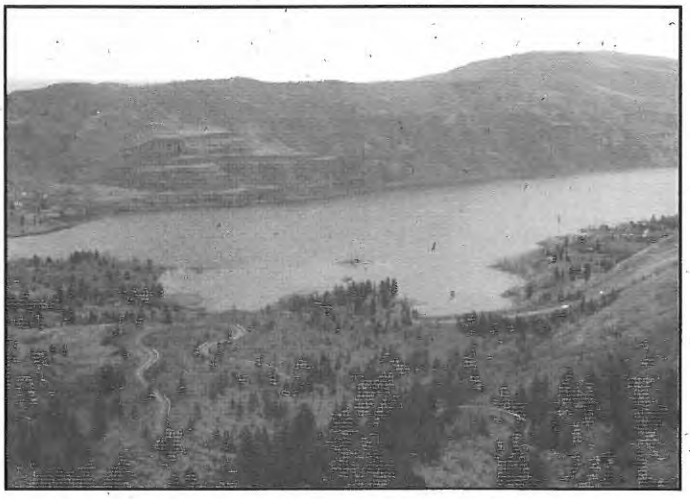
(a)[11] If any provision of sections 544 to 544p of this title or the application thereof to any person, State, Indian tribe, entity, or circumstance is held invalid, neither the remainder of sections 544 to 544p of this title, nor the application of any provisions herein to other persons, States, Indian tribes, entities, or circumstances, shall be affected thereby.

(Pub. L. 99-663, Sec. 18, Nov. 17, 1986, 100 Stat. 4302.)

[11] So in original. No subsec. (b) has been enacted.

Friends of the Columbia Gorge (2508)

MANAGEMENT PLAN
for the
Columbia River Gorge National Scenic Area



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Columbia River Gorge National Scenic Area Act

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Introduction

God shaped these great mountains round about us, and lifted up these mighty domes… He fashioned the Gorge of the Columbia, fixed the course of the broad river, and caused the crystal streams both small and great, to leap down from the crags and sing their never ending songs of joy.

Samuel Lancaster, 1915

The Columbia River Gorge is a national treasure. It contains an unparalleled combination of scenery, geology, plants, wildlife, and multicultural history. In November 1986, Congress recognized the world-class significance of the Gorge when it passed the Columbia River Gorge National Scenic Area Act. The proceedings and debates of the 99th Congress capture this significance:

"The Columbia River Gorge is a spectacular canyon where the Columbia River cuts through the Cascade Mountains and divides the States of Oregon and Washington. It includes abundant natural resources, including dramatic waterfalls and geologic formations." (*Congressional Record*, Senator Gorton)

"The Gorge, in itself, is an extremely important geological feature. . . . The Columbia River cut its way through the Cascade Range by eroding a 60 to 70 mile long, almost straight gorge with sharply raising escarpments of up to 3,000 feet above a river that ranges from 1/4 to 1-1/2 miles in width. . . . The Cascade Range affects climate, flora, and fauna in the region. The climate varies considerably from one end of the Gorge to the other. The western end of the Gorge has a mild, moist climate, while the eastern end has wide temperature ranges and approaches a semiarid condition." (*Congressional Record*, Representative Vento)

"Many threatened and endangered species of fish and wildlife live there. Tributary streams of the Columbia River within the Columbia Gorge contain important anadromous fish resources. . . The fantastic beauty of Columbia Gorge has beckoned mankind for over 11,000 years. In ancient times Chinookan and Sahaptain Indians hunted its mountains and fished along the river's edge. For centuries the Columbia River has been a major center of commerce and trade." (*Congressional Record*, Senator Evans)

"The complex geology and climatic conditions within the Gorge has produced an equally complex plant community . . . . Eight hundred plant species are found in the Gorge of which 58 are considered rare or endangered." (*Congressional Record*, Representative Vento)

"The Columbia River holds a unique place in the development of this country, and of the early history of the Pacific Northwest. It was the gateway for early traders, explorers and pioneers. The Gorge and the Columbia River continue

to have an important position in the economy of the entire Pacific Northwest." (*Congressional Record*, Senator Gorton)

"It is the location of some of the most wondrous scenic vistas in North America as well as the home of over 44,000 people. The hundreds of millions of dollars worth of commercial activity which occurs there has contributed to the area's attractive livability." (*Congressional Record*, Senator Hatfield)

"This grand old river's importance to the economy of the Northwest can hardly be overemphasized . . . . The towering waterfalls, spectacular vistas and unsurpassed recreation opportunities of the Gorge bring millions of visitors to the area every year." (*Congressional Record*, Representative Weaver)

OVERVIEW OF THE SCENIC AREA ACT

The Scenic Area Act identifies two purposes:

1. To establish a national scenic area to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge; and

2. To protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with paragraph 1.

The Scenic Area lies to the east of Portland, Oregon and Vancouver, Washington. It stretches about 83 miles from the Sandy River on the west to the Deschutes River on the east in Oregon and from Gibbons Creek in Clark County to a line 4 miles east of Wishram in Washington. The Scenic Area covers portions of six counties: Clark, Skamania, and Klickitat counties in Washington, and Multnomah, Hood River, and Wasco counties in Oregon. The map at the end of this chapter shows the location and boundaries of the Scenic Area.

To achieve the purposes of the Scenic Area Act, Congress called for preparation of a Management Plan that would treat the two-state, six-county area as a region. Congress established a two-tiered management approach for preparing the Management Plan. It divided responsibility between the U.S. Forest Service and the Columbia River Gorge Commission, a regional commission representing local, state, and national interests. The six Gorge counties were authorized to implement the Management Plan through their land use ordinances.

The Scenic Area is divided into three categories of land: Urban Areas, the Special Management Area (SMA), and the General Management Area (GMA).

Congress designated 13 cities and towns as Urban Areas: North Bonneville, Stevenson, Carson, Home Valley, White Salmon, Bingen, Lyle, Dallesport, and Wishram on the Washington side of the river and Cascade Locks, Hood River, Mosier, and The Dalles on the Oregon side. The Urban Areas are exempt from the Management Plan, but are eligible to receive federal funds authorized to

implement it. The Urban Areas will be the primary focus for future growth and economic development.

The SMA includes approximately 40 percent of the region's most sensitive lands, concentrated primarily in the western half of the Scenic Area. The U.S. Forest Service prepares land use designations and guidelines for the SMA. It has the authority to purchase lands, or interests in lands, in the SMA, and the opportunity to exchange federal lands elsewhere for privately held forest lands within SMA boundaries.

In some instances, the Act directs that the SMA lands be managed more stringently than those in the GMA. For instance, land divisions are prohibited, new homes are not allowed on parcels less than 40 acres in size, and forest practices are regulated for scenic, cultural, natural, and recreation concerns.

About half of the Scenic Area makes up the GMA, including the Columbia River. The Gorge Commission is authorized to plan for the GMA. These lands blanket most of the eastern Gorge and are scattered in the central and west end of the Gorge. They are predominantly devoted to agricultural and forestry uses, but also contain scattered areas of existing residential development.

A VISION OF THE COLUMBIA GORGE

Taking its cue from the Scenic Area Act and Congress's emphasis of the qualities of the Scenic Area, the Gorge Commission developed a vision statement. This statement, which follows, provided a framework for developing the Management Plan and continues to guide the Gorge Commission's actions.

The Columbia River Gorge is an area of worldwide importance,

Where scenic qualities and diverse landscapes, together with their natural and cultural components, are paramount,

Where development and recreation are carefully placed in a manner that protects resources,

Where the human presence is lightly demonstrated, and where lessons from the past are a constant guide and inspiration for the future.

To achieve this vision the Columbia River Gorge Commission will provide:

Stewardship of this legacy and trust,

Leadership for implementation of the National Scenic Area Act and the Management Plan,

Partnership with communities, tribal governments, and agencies, and

A vision of the Gorge as a region and the river as a bond.

Columbia River Gorge Commission
1988

The Management Plan for the Scenic Area is based upon a vision created by Congress, the Gorge Commission, the U.S. Forest Service, county and city governments, state and federal agencies, Indian tribal governments,

concerned citizens, and interest groups. The vision provides a sense about the future of the Gorge 20, 50, or 100 years from now. It supplies the adhesive that binds the plan.

The first lines of the vision were drawn by Congress in the purposes and standards of the Scenic Area Act. These bold strokes call for a delicate balance of protection and development. The Scenic Area Act recognizes the human presence amidst a spectacular landscape with remarkable natural resources and presents a model for reconciliation between them.

The reconciliation lies in Congress's different treatment of Urban Areas from the rest of the Scenic Area. The vision calls for prosperous cities and towns in the Gorge. Significant commercial, residential, and industrial development is encouraged in Urban Areas.

Urban Areas are eligible for federal funds under the Scenic Area Act. They may expand over time, even at some cost to scenic, cultural, natural, or recreation resources. However, they must grow efficiently to minimize costs of growth and to function as providers of services. In short, the vision tips the balance toward development in the Urban Areas.

The Management Plan reinforces this vision for the Urban Areas. It encourages urban development to occur in the Urban Areas and limits such uses outside Urban Areas. The Act authorizes partial funding for two centers, one on each side of the Columbia River. The Gorge Commission chose an Urban Area for a conference center (Skamania Lodge Center in Stevenson, Washington) and a location near an Urban Area for an interpretive center (The Gorge Discovery Center in The Dalles, Oregon). The Gorge Commission and the Forest Service may direct some federally appropriated recreation funds to the Urban Areas. Outside Urban Areas, new commercial development is limited to those areas where commercial development is already occurring and other areas uniquely suited to commercial use in conjunction with resource-based recreation.

Outside Urban Areas, the vision calls for protection of the grandeur of one of America's great landscapes. Standards in the Scenic Area Act require protection and enhancement of scenic, cultural, natural, and recreation resources. Development is welcome, but it must not adversely affect these resources or interfere with the prosperity of the Urban Areas. In short, outside the Urban Areas, the vision tips the balance toward protection and enhancement of Gorge resources. This vision paints a picture far from devoid of human enterprise outside of Urban Areas. It embraces agriculture and forestry and accords a special role to recreation. The forests, pastures, and rolling cropland of the western Gorge; the woodlands, orchards, and vineyards of the middle Gorge; and the expansive grazing and wheat lands of the eastern Gorge are protected from residential and commercial sprawl. Agricultural and managed forest lands are not only part of the cultural landscape of the Gorge; they also make a significant contribution to the Gorge economy.

Recreation received much attention from Congress in the Scenic Area Act. Congress envisioned new points of access to the Columbia River and its

tributaries, visitor accommodations, trails, viewpoints, and interpretive facilities. Authorization of funds for new recreation facilities gives added emphasis to the vision.

Reconciliation between protection and development of resources lies also in Congress's different treatment of the SMA from the GMA. Congress strictly limited new development in the SMA: no land divisions, no commercial development unless recreational in nature, and no new houses on tracts of land smaller than 40 acres. Congress did not apply any of these limitations in the GMA. Congress also authorized $40 million for acquisition of interests in lands in the SMA. Acquisitions can be made in the GMA before counties implement land use ordinances, but only through condemnation. In short, Congress saw the SMA as indeed special, where little new development would occur.

The Management Plan will protect the Gorge's scenic travel corridors from strip commercial development. In the Gorge today, a clear distinction exists between town and country. The plan will secure that distinction.

The Gorge landscape will remain largely as it is--always changing, always the same. Wild areas of the SMA will remain wild. Forests and farms will come and go, and come again. They will not be replaced by residential subdivisions. New developments will tread lightly upon the landscape and will blend into the landscape as seen from key viewing areas. Rural settlements will retain their existing character and rural way of life, including a strong tradition of home-based occupations. Enhancement programs based upon incentives for property owners and managers will, over time, sustain essential values and remove unnecessary discordant features from the landscape.

Much will be learned and preserved about the rich cultural history of the Gorge. An ambitious survey process will disclose now unknown archaeological resources from more than 10,000 years of continuous Native American culture. The Management Plan envisions a process of learning about and avoiding disturbance of cultural resources, and of interpretation without adverse effect, all in close consultation with the four Indian tribal governments that have treaty rights within the Scenic Area (Nez Perce, Umatilla, Warm Springs, and Yakima). The survey process also will provide information about the settler culture and ways of life.

The Management Plan envisions healthy populations of sensitive plant and wildlife species throughout the Gorge, accomplished by protecting and enhancing their habitat. It will stem the loss of habitat. Buffers will keep conflicting development a safe distance from sensitive plants, wetlands, and riparian areas. Regulation of density will limit the cumulative effect of development to acceptable levels. A "no loss" policy in the SMA (except in limited circumstances) and a "no net loss" goal in the GMA will curb the loss of wetlands.

A chain of new wildlife refuges will emerge on the islands in the Columbia River and on river bottomlands in the western Gorge. The refuges, together with more careful regulation of grazing on public land, will improve wetlands

and riparian areas over time. Incentive and education programs will lend support to traditional good stewardship in the Gorge. These programs will help improve and restore wetlands and riparian areas on private lands.

New vistas, small-scale travelers' accommodations, campgrounds, river access points, trails and other forms of resource-based recreation, both publicly owned and privately owned, will be created in rural areas throughout the Scenic Area. Like other development, however, these new recreation facilities will blend into the landscape. New facilities will not locate on the Gorge's most valuable agricultural land. Recreation growth will respond to demand within resource constraints and will be carefully planned so it does not overwhelm the Gorge and the ability of Gorge communities to support it.

Public and private partnerships will develop--as they already have with the conference and interpretive centers--to multiply the effect of federal funding for recreation facilities. As the number of tourists and recreationists grows and generates adequate demand, alternative modes of transportation-- boat, rail and bus--will become a form of recreation. A network of connected and coordinated trails will develop, including riverfront trails and trails linked to Urban Areas. New recreation facilities, such as The Gorge Discovery Center, will entice visitors to the east end of the Gorge. This will help spread the economic benefits of tourism and relieve some of the pressure on recreation sites in the west end of the Gorge.

Stretches of the Historic Columbia River Highway now closed to the public will be restored for recreation access. They will become among the premier hiking, biking, and wheelchair facilities in the Northwest, featuring the outstanding scenery and rich history associated with this national landmark.

Recreation planning will reach new levels of coordination among landowners, recreation purveyors, and providers of emergency, public safety, and other kinds of services. Agencies will develop a system of recreation user fees to support services.

Such are some of the outcomes of the Management Plan based on a collective vision for the Gorge's future. In short, the vision and the plan seek to keep the unique resource qualities of the Gorge intact in the years ahead and to encourage growth and development consistent with these qualities, steering it primarily into Urban Areas.

HISTORICAL BACKGROUND

The Columbia River Gorge was forged from geological events dating back millions of years. It was shaped further at the end of the Ice Age by the great Missoula floods that followed and by the vulcanism that created the Cascade Mountains. In a report to the Gorge Commission, author and Portland State University professor John Eliot Allen wrote the following:

"The geologic evolution of the Columbia River Gorge is a result of 40 million years of predominantly volcanic activity. But it also involves faulting, folding, uplift and subsidence, erosion and sedimentation, repeated northward movement of the [Columbia River] valley, a period of cataclysmic flooding,

and finally extensive landsliding. The Gorge thus exhibits a remarkable diversity of geologic events matched by few other places in North America."

The human presence in the Gorge, dating back at least 10,000 years, undoubtedly is related in part to the physical geography of the Northwest. The near sea-level passage of the Columbia River through the Cascade Mountains provided a natural corridor, a relatively easy means of movement for early inhabitants. But the river's remarkable fishing opportunities, easily accessible at Celilo Falls, also drew these early inhabitants to the Gorge. Over time, subsistence needs led to exchange and eventually to the barter among Native Americans that Lewis and Clark observed in 1805.

In more recent time, in addition to the Lewis and Clark expedition, the Gorge served as a transportation corridor for fur traders. It became a passage route for settlers and missionaries following the Oregon Trail. It was an area of tensions between fur traders and Native Americans and altercations involving Native Americans, missionaries, and settlers, culminating in the signing of treaties in 1855. The beginning of non-Native American settlements followed, and an influx of newcomers has continued to this day.

In the last half of the 1800's, river and then railroad transportation came of age. The 1850's witnessed the beginning of the colorful era of sternwheelers plying the river and eventually the development of locks to bypass the Cascade rapids. This was followed by the financial ups and downs of the great railroad-building competition that eventually brought what is known today as the Union Pacific along the south bank of the Columbia River (completed in 1889) and what is known today as the Burlington Northern along the north bank (completed in the first decade of the 1900's). A bake-oven or two still mark the campsites of the Chinese railroad gangs that cut the rail route through the Gorge on the south bank.

The Gorge was to experience still more change in the era of highway building. What is known today as the Historic Columbia River Highway, started in 1913 near Troutdale, was pushed through to Hood River in 1915 and finally completed to The Dalles by 1922. A sensitive balance between engineering necessity and the beauty of its surroundings, this highway opened the Gorge to recreation and stimulated growth and development in communities on both sides of the river. As automotive transportation became more universal, the present Washington State Highway 14 was pushed through in segments, and bridge crossings of the Columbia River replaced ferries at Hood River (1918) and Cascade Locks (1925) and eventually The Dalles. These changes were capped finally by Interstate 84, developed through the Gorge on the south bank of the Columbia River in the 1950's.

Arguably, the greatest change in the Gorge was the damming of the river: Bonneville Dam dedicated in 1937 and The Dalles Dam completed in 1960. These and other dams converted the swift flow of the Columbia River into a series of lakes. They resulted in the revival of river transportation and the introduction of power transmission lines visible today in many parts of the Scenic Area.

By the 1930's, development impacts on the Gorge were becoming a source of concern. In 1937, the Pacific Northwest Regional Planning Commission pointed out that the qualities of the Gorge had national significance. It proposed that the area be established as an interstate park. World War II interrupted the growing interest in protecting Gorge resources, but by the 1950's both Oregon and Washington created gorge commissions. Their effectiveness, however, became limited by inadequate funding, lack of authority, and opposition from various factions.

In the 1970's, successor commissions, by now meeting together, helped four county planning agencies prepare special Gorge zoning provisions regulating development along the river. In 1979, the U.S. National Park Service made a comprehensive study of the area. The findings, published in 1980, indicated trends toward land development that threatened the resources of the Gorge.

From 1980 through 1984, several Columbia River Gorge bills appeared before Congress, but there was no consensus in the Northwest delegation. At a retreat in the summer of 1985, philosophical differences were finally resolved, and late in the 1986 session, Congress passed the Columbia River Gorge National Scenic Area Act (Public Law 99-663).

DEVELOPMENT OF THE MANAGEMENT PLAN

The Scenic Area Act specified a schedule and a three-step process for developing the Management Plan. It directed the Gorge Commission and the Forest Service to complete inventories during the first year. It called for land use designations in the second year. In the third year, the Scenic Area Act required development of guidelines and adoption of the Management Plan.

The Act required the U.S. Secretary of Agriculture to review the plan during the fourth year. The six counties or the Commission must then implement the plan by ordinance.

Inventories

Congress called for three major inventories: a recreation assessment, a resource inventory, and an economic opportunity study. The Gorge Commission and Forest Service completed most of these inventories in 1988. The inventories form the information base of the Management Plan.

The recreation assessment includes an overview of existing recreation facilities and a study of recreation demand in the region. It was used to identify areas suitable for public recreation facilities, including additional river access.

The resource inventory is a compilation of information about existing resources in the Scenic Area, ranging from wetlands to scenic values. The principal components of the resource inventory are shown in Table 1.

The economic opportunity study provides an overview of the Gorge economy, an analysis of its principal economic sectors, an assessment of economic strengths and weaknesses, and identification of the best opportunities to improve the economy. The main responsibility for economic

development is reserved for the two states and is largely set forth in other documents.

In addition to these inventories, the Gorge Commission and the Forest Service identified and mapped recreation intensity classes and landscape settings. The Scenic Area is divided into four recreation intensity classes, indicating suitability for present and future recreation use. (See Part I, Chapter 4: Recreation Resources.) The Scenic Area was also mapped for 13 landscape settings, each reflecting a distinct combination of landforms, vegetation, and land use patterns. Design guidelines will help maintain the character of each landscape setting, while accommodating new development. (See Part I, Chapter 1: Scenic Resources.)

Land Use Designations

The Scenic Area Act next called for the development of land use designations that would be used to map areas suitable for various kinds of future land and resource use. The designations include agriculture, forestry, residential and commercial development, and recreation facilities. The Act also said that special and sensitive lands should be protected as open space. Preliminary land use designation maps were prepared and presented to the public at workshops in fall 1989. Formal land use designations were then incorporated into the Management Plan. Table 2 shows the acres of land contained in each land use designation.

Guidelines

The Gorge Commission's and Forest Service's next task was to combine the resource inventories with land use and recreation designations to develop goals, objectives, policies, and guidelines for the Management Plan. The Scenic Area Act specified that these guidelines must:

- Protect and enhance agricultural lands for agricultural uses, yet allow their conversion to open space, recreation development, or forest lands.
- Protect and enhance forest lands for forest uses, yet allow their conversion to agricultural lands, recreation development, or open space.
- Protect and enhance open spaces.
- Protect and enhance public and private recreation resources and education and interpretative facilities and opportunities.
- Prohibit industrial development outside Urban Areas.
- Require commercial and residential development to occur without adversely affecting scenic, cultural, recreation, and natural resources.
- Require that exploration, development, and production of mineral resources take place without adversely affecting scenic, cultural, recreation, and natural resources.

Consultation and Public Involvement

Integrated into this planning process was a series of consultations with county, state, and federal officials and the four Indian tribal governments with

treaty rights in the Scenic Area. A major public involvement program was also conducted.

Issues and goals were identified in two rounds of meetings in each county with what came to be called "key community contacts" made up of volunteer citizens and community leaders. The first round focused on issues and goals, and the second round on policy alternatives and on standards for carrying out policies. Each round of meetings was followed by wide circulation of newssheet mailers and by open houses to reach residents at large.

In addition, a series of workshops to gather public input on recreation issues was held. Finally, two different drafts of the Management Plan were broadly circulated, culminating in three public hearings for each draft. As drafts of the Management Plan were discussed, special attention was given to informing residents how their property was affected by land use designations and guidelines.

Final Management Plan

The Gorge Commission adopted the final version of the Management Plan in October 1991. The plan includes guidelines and land use designations for the GMA and the SMA prepared by the Gorge Commission and Forest Service, respectively. The Management Plan was sent to the U.S. Secretary of Agriculture for concurrence in November 1991, as required by the Scenic Area Act. The U.S. Secretary of Agriculture concurred with the Management Plan in February 1992.

Revision and Amendment

Congress directed the Gorge Commission to review the Management Plan no sooner than 5 years, but at least every 10 years, to determine whether it should be revised. If the Gorge Commission finds at any time that conditions have changed significantly, it may amend the plan. Any such revision or amendment must follow the procedures established in the Scenic Area Act for the original adoption of the plan.

From 1997 to 2000, the Gorge Commission, Forest Service and local and state agencies monitored the implementation of the Management Plan. A series of reports evaluated the findings in development review decisions for scenic, cultural, natural and recreation resources, and for agriculture and forest lands.

From 2000 to 2004, the Gorge Commission and Forest Service reviewed and revised the Management Plan, and the *Revisions to the Management Plan* was adopted by the Gorge Commission in May 2004. The Secretary of Agriculture concurred with the Revisions in August 2004.

ORGANIZATION OF THE MANAGEMENT PLAN

The Management Plan is organized into four parts, following this Introduction.

Part I identifies goals, objectives, policies, and guidelines for resource protection and enhancement. Individual chapters cover scenic resources, cultural resources, natural resources, and recreation resources.

Part II addresses land use designations. Individual chapters identify the goals, objectives, policies, and guidelines for each land use category: agricultural land, forest land, open space, residential land, commercial land, and recreation designations. These six chapters are followed by a chapter on general policies and guidelines that affect all uses in the Scenic Area, regardless of land use designation.

Part III outlines an action program, with chapters devoted to the recreation development plan, economic development, enhancement strategies, and interpretation and education.

Part IV focuses on the role of the Gorge Commission, the Forest Service, and Indian tribal treaty rights and consultation.

The **appendix** contains a copy of the Scenic Area Act. A **glossary** and **index** are provided to facilitate use of the document.

All chapters in Parts I and II, and Chapter 1 in Part III, are organized so the first part of the chapter focuses on the GMA (or combined GMA and SMA) and the second part focuses on the SMA.

Management Plan Maps

The Management Plan contains three principal maps:

- Landscape settings (used in conjunction with Part I, Chapter 1: Scenic Resources)
- Recreation intensity classes (used in conjunction with Part I, Chapter 4: Recreation Resources)
- Land use designations (used in conjunction with the land use designations addressed in Part II)

These are the official maps for determining the landscape setting, recreation intensity class, and land use designation for a specific parcel of land.

The official boundary lines for the GMA, SMA, Urban Areas, and National Scenic Area exterior boundaries are contained on the maps referenced in Section 4 of the Scenic Area Act. Copies of these maps are available for review at the offices of the Gorge Commission and the Forest Service, National Scenic Area.

HOW TO USE THE MANAGEMENT PLAN

A primary purpose of the Management Plan is to ensure that land in the Scenic Area is used consistently with the purposes and standards of the Scenic Area Act. The plan usually allows a parcel of land to be used for several purposes. For example, a residence, a small farm, or a moderate-size campground is allowed on some parcels in the GMA designated Small-Scale Agriculture.

Reviewing the appropriate maps, policies, and guidelines in the Management Plan will indicate how a given parcel of land may be used. A step-by-step process for using the Management Plan is outlined below. This process provides a framework that allows landowners and land managers to explore land use options.

Step 1: Determine GMA/SMA and Land Use Designations

The first step in determining how a parcel of land may be used is to consult the land use designations map. This map provides two important pieces of information: 1) it indicates whether a parcel is in the GMA or the SMA, and 2) it shows which land use designation is applied to the parcel.

Six basic land use designations are used in the Scenic Area: agricultural land, forest land, open space, residential land, commercial land, and recreation. Most of these designations consist of several sub-designations. For example, recreation includes two sub-designations: Public Recreation and Commercial Recreation.

The land use designations provide initial information about how a parcel may be developed; they reflect the primary use for which a parcel is suited. For instance, agricultural lands are suitable for growing crops and raising livestock. Commercial lands are suitable for certain types of new businesses.

The second step in the process is to determine the exact uses allowed on a parcel of land. Landowners and land managers interested in non-recreation uses, or in recreation uses on lands designated Public Recreation or Commercial Recreation, should proceed to Step 2, below.

Some level of recreation development is potentially allowed on all parcels in the Scenic Area, regardless of the land use designation. The Management Plan contains special guidelines that prescribe the types and intensities of recreation development allowed throughout the Scenic Area. Individuals wishing to explore these options, but whose property is not designated Public Recreation or Commercial Recreation, should proceed to Steps 5-A though 5-C.

Step 2: Identify Uses Allowed in Land Use Designations

The policies and guidelines in Part II of the Management Plan specify the uses allowed within each land use designation. These chapters contain separate policies and guidelines for the GMA and the SMA. Landowners and land managers should consult the applicable policies and guidelines.

The policies specify criteria that were used to determine which land use designation was applied to a parcel of land. The policies also provide minimum sizes for new parcels in the GMA. This information determines whether a parcel of land may be divided into smaller parcels. (Parcel sizes appear also on the large-scale (1:24,000) land use designations map available at county planning departments and Gorge Commission and Forest Service offices.)

The guidelines list new uses that are allowed within a land use designation. Three categories of uses are generally listed. The first category consists of uses not requiring review by a county planning department. These uses are listed under guidelines titled "Uses Allowed Outright." The second category consists of uses that may be allowed after an expedited review and approval process by a county planning department. These uses are listed under guidelines titled “Uses Allowed

through the Expedited Development Review Process." Uses that may be allowed after a full review and approval by a county planning department form the third category. They are listed under the heading "Review Uses."
The Commission will review all proposed uses if a county government fails to adopt ordinances consistent with the Management Plan.

Step 3: Identify Approval Criteria for Review Uses

Most land use designation chapters contain guidelines that must be satisfied before uses listed under "Review Uses" can be approved. For example, residences and other non-recreation uses may be allowed on lands designated Public Recreation if they fulfill the criteria in the guideline titled "Approval Criteria for Non-Recreation Uses in Public Recreation." Similarly, new structures within a forest lands designation must satisfy guidelines regarding fire protection.

Similar guidelines for key uses that are allowed in more than one land use designation are consolidated in Part II, Chapter 7: General Policies and Guidelines. These uses include all uses allowed through expedited review, land divisions, temporary use for hardship dwellings, sewer and water services, home occupations and cottage industries, bed and breakfast inns, and others.

Step 4: Protect Scenic, Cultural, Natural, and Recreation Resources

The Scenic Area Act prohibits uses that adversely affect scenic, cultural, natural, or recreation resources. Part I of the Management Plan includes a chapter addressing each of these resources. All the chapters in Part I should be reviewed to determine which provisions apply to a parcel of land. Inventory maps identify some resources that must be protected. The maps for wetlands, streams, ponds, lakes, sensitive wildlife habitat, rare plants, and natural areas show if natural resources occur on a parcel. The landscape settings map should be consulted to determine which landscape settings guidelines apply. The cultural resources map shows the location of previously identified archaeological and historic resources. Inventory maps may be reviewed at the offices of the Gorge Commission, Forest Service, and county planning departments.

The policies and guidelines in Part I consist primarily of measures that minimize possible adverse effects of development. They may affect the size, design, and siting of new uses. For example, the guidelines for scenic resources may influence the siting of structures so they are screened by topography or existing trees. Similarly, structures may be allowed near lakes and rivers if they are set back a specified distance from the shoreline.

Some of the resource protection provisions apply to all new uses; others are specific and apply only to particular types of uses. For instance, the scenic resources chapter includes guidelines that only regulate uses that will be seen from key viewing areas and scenic travel corridors. In contrast, the landscape setting guidelines in that chapter apply to new uses throughout the Scenic Area. The policies in the cultural resources chapter require a cultural resources survey before some uses are allowed. If no cultural

resources are discovered, the remaining guidelines are not applied. The provisions in the natural resources chapter are applied only if a natural resource would be affected by new development.

The following steps further apply to recreation developments:

Step 5-A: Determine Recreation Intensity Class

Persons who wish to develop resource-based recreation uses on lands not designated Public Recreation or Commercial Recreation should consult the recreation intensity classes map. (Resource-based recreation means recreation uses that depend upon the natural, scenic, or cultural resources of the Scenic Area.) Four recreation intensity classes are identified. Different types and intensities of recreation are allowed in each class.

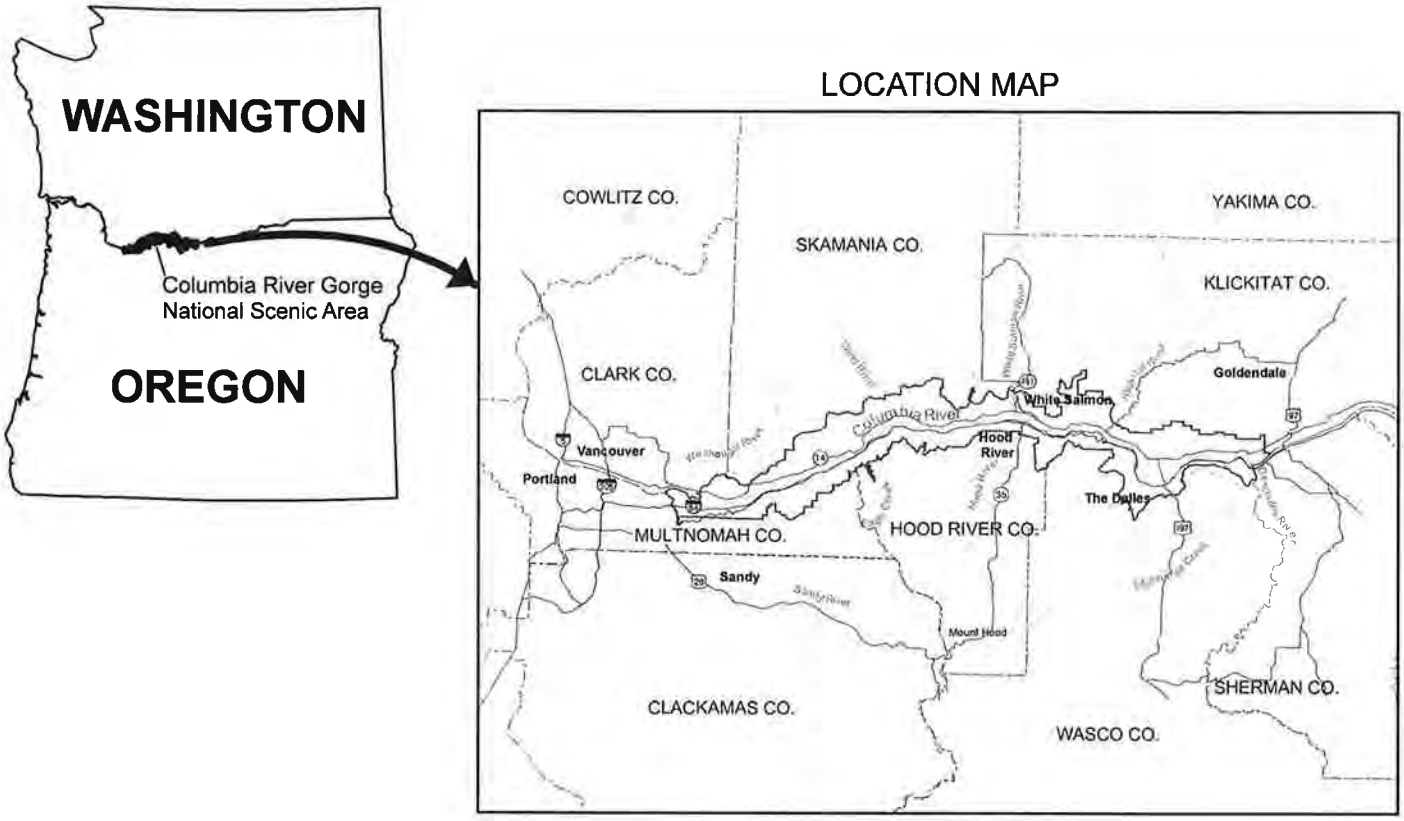
Step 5-B: Identify Uses Allowed in Recreation Intensity Classes

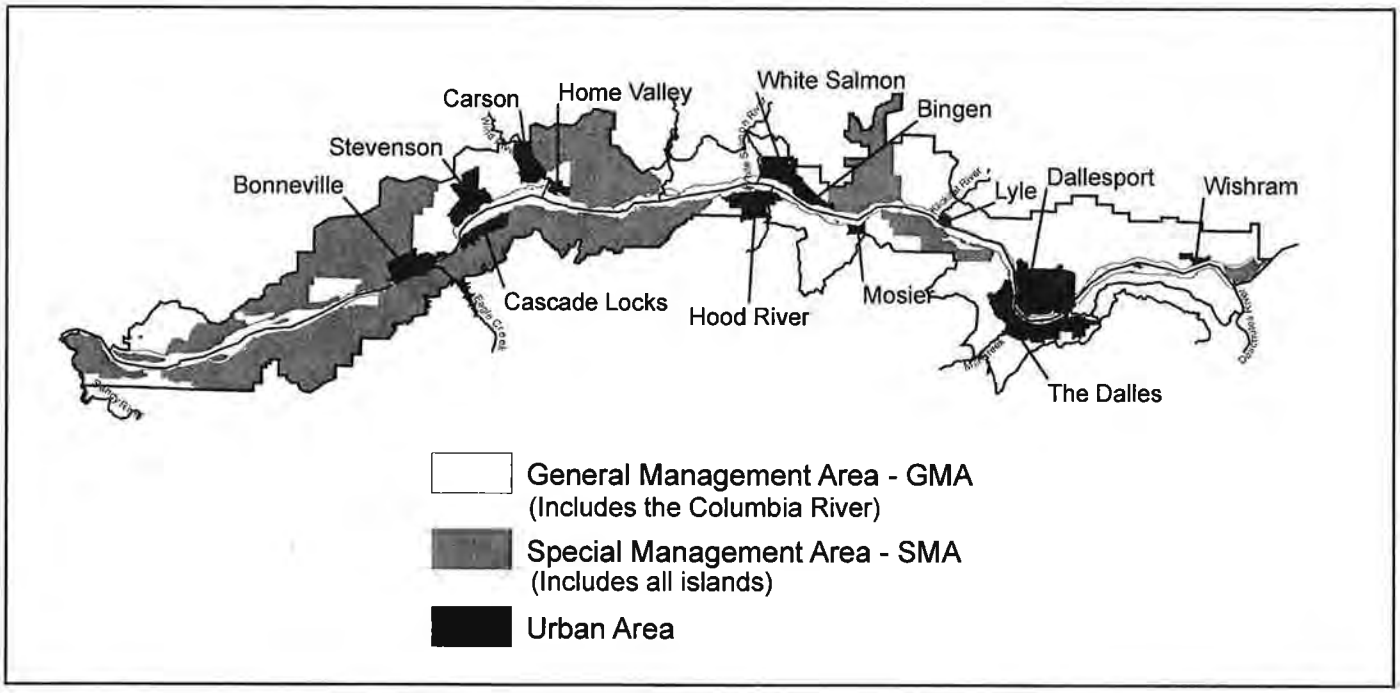
The guidelines in the "Recreation Intensity Classes" section of Part I, Chapter 4: Recreation Resources, list the recreation uses allowed in each intensity class. Recreation uses range from very low-intensity uses (Class 1), such as trails and simple interpretative displays, to high-intensity uses (Class 4), such as recreational vehicle parks and boat ramps.

Step 5-C: Identify Approval Criteria for New Recreation Uses

In each recreation intensity class, new recreation uses must be reviewed by a county planning department. County planners ensure that recreation uses comply with applicable guidelines in the "Recreation Intensity Classes" section. These guidelines address issues such as transportation, Indian treaty rights, fire prevention, and adjacent forest and agricultural uses. Special guidelines address the design of recreation facilities. (Recreation facilities mean a cluster or grouping of recreation developments or improvements.) These guidelines govern five basic design elements: parking, landscaping, signage, and siting and appearance of structures.

The final step in this process is to ensure that new recreation uses do not adversely affect scenic, cultural, and natural resources. The policies and guidelines that protect these resources are discussed in Step 4, above.





VICINITY MAP

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA

Table 1

Resource Inventories

(Prepared prior to initial Management Plan adoption, 1988-1991)

Resource	Source of Information	Purpose of Inventory
Geological features	Geologist, field visits	Protection of features, avoidance of hazards
Wetlands	U.S. Fish & Wildlife Service	Protection of resource
Soils	U.S. Soil Conservation Service, U.S. Forest Service forestry	Determine suitability for agriculture,
Fish habitat	Federal, state agencies	Protection of resource
Hazards	Local, state, federal agencies	Avoidance of hazards
Vegetation cover	Field visits, aerial photography	Identification of cover types for land use designations
Habitat of rare, threatened, endangered, endemic plant species	State Heritage Programs, field visits, organizations	Protection of resource
Wildlife habitat	State agencies	Protection of resource
Existing land use	Counties, field visits, aerial photography	Land use designations
Topography	U.S. Geological Survey	Land use designations, avoidance of hazards
Scenic resources	Field visits, photography	Protection of resource
Historic and prehistoric sites, structures, objects	Tribal governments, federal, state, local agencies	Protection of resource
Land ownership, parcels	County assessors	Land use designations
Taxation, political boundaries	Counties, special districts suitability	Development
Natural areas	State Heritage Programs, field visits, aerial photos	Protection of resource
Existing plan, zone designations	Counties	Land use designations

CHAPTER

1

Scenic Resources

The Columbia Gorge is world renowned for its outstanding scenic beauty. The sea level chasm the Columbia River has cut through the Cascade Mountains, and the dramatic diverse landscapes it contains, create unparalleled grandeur. Within an hour's drive, one can witness towering cliffs and forests, orchards and farms, and sweeping grasslands. It is widely acknowledged that the need to protect the special scenic resources of the Gorge provided the major impetus for establishing the Scenic Area. Much of the Gorge, with it steep landforms, forested slopes, waterfalls, pastoral areas, and rural townscapes, has outstanding visual diversity.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act's first purpose, as stated in Section 3(1), includes a mandate to protect and enhance scenic resources of the Columbia River Gorge. The Act directs the Gorge Commission to inventory the scenic resources of the Gorge and protect them by establishing guidelines and designating areas as open space. Open spaces, which the Gorge Commission is charged to protect and enhance [Section 6(d)], include: "scenic. . . areas;. . . outstanding scenic views and sites;. . . and Federal and State wild, scenic, and recreation waterways" [Section 2(l)].

KEY ISSUES

Several major issues had to be addressed in developing scenic resource protection provisions. One of the greatest challenges has been the need to establish guidelines to accommodate new development in a manner that protects Gorge scenic quality in the face of significant growth pressures for residences and related development. These pressures result from a number of factors, including substantial growth of the Portland/Vancouver metropolitan area and the rapid development of the Gorge as the leading windsurfing area in North America, if not the world. The fact that the Gorge consists of many steep areas where development can be highly visible, combined with the desire for new residences with panoramic views, poses major challenges. The need to develop provisions that address long-term, cumulative effects of new development on the character of existing landscapes is as crucial as measures addressing the impacts of individual developments.

Another issue involves meeting the Scenic Area Act's mandate to increase recreation river access while protecting scenic resources. Much of the shoreline area is both significant and sensitive from a scenic standpoint. This challenge required specific policies and

guidelines that accommodate additional river-oriented recreation in a careful and sensitive manner.

OVERVIEW OF SCENIC RESOURCES PROVISIONS

The Gorge Commission and Forest Service have developed specific programs to address protection of scenic quality on lands seen from key viewing areas, maintenance of existing landscape settings, establishment of scenic travel corridors, and provisions for signage. The goals, objectives, policies and guidelines of this chapter provide a framework to guide actions of federal, state, and local agencies and private entities that may affect scenic resources of the Scenic Area. This chapter is divided into the following sections:

GMA Provisions:

- Overall Scenic Provisions
- Key Viewing Areas
- Landscape Settings
- Scenic Travel Corridors
- Signs

SMA Provisions:

- SMA Scenic Goals and Policies
- SMA Design Guidelines Based on Landscape Settings
- SMA Guidelines for Development and Uses Visible from KVAs
- SMA Guidelines for KVA Foregrounds and Scenic Routes
- SMA Guidelines for Areas not seen from KVA

GMA PROVISIONS

OVERALL SCENIC PROVISIONS

GMA Goal

Protect and enhance the scenic resources of the Scenic Area.

GMA Objectives

1. Encourage the establishment of programs offering incentives and other means of implementing scenic resource enhancement objectives and policies for existing uses, targeting private landowners, railroad and utility companies, and transportation and other public agencies.

2. Encourage the establishment of a Scenic Area public land conservancy and/or nonprofit land trust to acquire fee interest, conservation easements, and other interests in properties whose preservation is important for protection of Gorge landscape settings and scenic values.

GMA Policies

1. Except for production and/or development of mineral resources and disposal sites for spoil materials from public road maintenance activities, nothing in the key viewing areas or landscape settings guidelines in this chapter shall be used as grounds to deny proposed uses otherwise authorized by the land use designation. However, the guidelines may affect the siting, location, size, and other design features of proposed developments, and compliance with them is mandatory.

2. The goals, objectives, policies, and guidelines in this chapter shall not affect agriculture or forest practices, nor equipment or structures (other than buildings) associated with such practices, such as irrigation equipment or orchard fans.

3. New development shall be compatible with its designated landscape setting (as described in the "Landscape Settings" section of this chapter). Expansion of existing development shall be compatible with its landscape setting to the maximum extent practicable.

4. New production and/or development of mineral resources and expansion of existing quarries shall include a reclamation plan to restore the site to a natural appearance that blends with and emulates surrounding landforms to the maximum extent practicable.

5. New development shall retain existing landforms and strive to fit into the existing topography to the maximum extent feasible.

6. The Gorge Discovery Center shall be designed and constructed to be visually subordinate as seen from key viewing areas and compatible with its landscape setting to the maximum extent practicable, consistent with its mission.

GMA Guidelines

1. New buildings and roads shall be sited and designed to retain the existing topography and to minimize grading activities to the maximum extent practicable.

2. New buildings shall be compatible with the general scale (height, dimensions and overall mass) of existing nearby development. Expansion of existing development shall comply with this guideline to the maximum extent practicable.

3. Project applicants shall be responsible for the proper maintenance and survival of any planted vegetation required by the guidelines in this chapter.

4. A site plan and land use application shall be submitted for all new buildings, except for buildings smaller than 60 square feet in area and less than or equal to 10 feet in height, as measured at the roof peak. The site plan and application shall include all information required in the site plan guidelines in "Review Uses" (Part II,

Chapter 7: General Policies and Guidelines). Supplemental requirements for developments proposed on lands visible from key viewing areas are included in the key viewing areas guidelines in this chapter.

5. For all proposed development, the determination of compatibility with the landscape setting shall be based on information submitted in the site plan.

6. For all new production and/or development of mineral resources and expansion of existing quarries, a reclamation plan is required to restore the site to a natural appearance that blends with and emulates surrounding landforms to the maximum extent practicable.

   At a minimum, such reclamation plans shall include:

   A. A map of the site, at a scale of 1 inch equals 200 feet (1:2,400) or a scale providing greater detail, with 10-foot contour intervals or less, showing pre-mining existing grades and post-mining final grades; locations of topsoil stockpiles for eventual reclamation use; location of catch basins or similar drainage and erosion control features employed for the duration of the use; and the location of storage, processing, and equipment areas employed for the duration of the use.

   B. Cross-sectional drawings of the site showing pre-mining and post-mining grades.

   C. Descriptions of the proposed use, in terms of estimated quantity and type of material removed, estimated duration of the use, processing activities, etc.

   D. Description of drainage/erosion control features to be employed for the duration of the use.

   E. A landscaping plan providing for revegetation consistent with the vegetation patterns of the subject landscape setting, indicating the species, number, size, and location of plantings for the final reclaimed grade, as well as a description of irrigation provisions or other measures necessary to ensure the survival of plantings.

7. All reclamation plans for new quarries or expansion of existing quarries shall be sent to the appropriate state reclamation permitting agency for review and comment. The state agency shall have 30 calendar days from the date a reclamation plan is mailed to submit written comments on the proposal. State agency comments shall address the following:

   A. Whether the proposed mining is subject to state reclamation permit requirements;

B. If subject to state jurisdiction, whether an application has been received for a state reclamation permit and, if so, the current status of the application; and

C. For uses subject to state jurisdiction, any issues or concerns regarding consistency with state reclamation requirements, or any suggested modifications to comply with state reclamation requirements.

Scenic Area implementing agencies may request technical assistance from state agencies on reclamation plans for proposed mining not within the state agency's jurisdiction.

KEY VIEWING AREAS

GMA Goal

Emphasize protection and enhancement of Gorge landscapes seen from key viewing areas.

GMA Objectives

1. Establish scenic enhancement programs prioritizing enhancement of lands seen from key viewing areas.

2. Establish a program to phase-out existing quarries and associated activities and develop reclamation plans for such quarries at sites where the Gorge Commission determines that such uses adversely affect scenic resources on land visible from key viewing areas. The Gorge Commission shall initiate this objective by inventorying existing quarries visible from key viewing areas. Phase-out plans may require some additional quarrying for a limited time to best achieve contours that blend with surrounding landforms. Phase-out and reclamation plans for particular quarries shall include a specified time period for completion, not to exceed 5 years from the commencement of such plans.

3. Encourage mining reclamation methods and features that enhance wildlife habitat and wetlands, ameliorate visual impacts of existing quarries, and accelerate achievement of desired visual quality objectives.

4. Encourage use of planned unit developments, clustering, lot reconfiguration and consolidation, and other techniques to reduce visual impacts of new development on lands that are visible from key viewing areas and that possess high or critical visual sensitivity.

5. Encourage plantings of native species or species characteristic of the landscape setting to screen existing development that is not visually subordinate on lands that are visible from key viewing areas and that possess high or critical visual sensitivity.

GMA Policies

1. Important public roads, parks, and other vantage points providing public scenic viewing opportunities shall be designated as key viewing areas, as identified in the glossary of the Management Plan.

2. Except for new production and/or development of mineral resources, new development on lands seen from key viewing areas shall be visually subordinate to its landscape setting. This policy shall not apply to specified developed settings that are not visually sensitive (as identified in the "Landscape Settings" section), rehabilitation or modifications to significant historic structures, shorelines on the main stem of the Columbia River that adjoin Urban Areas, or other developments expressly exempted from this requirement in this chapter.

3. In developing conditions of approval, agencies shall emphasize those elements that, in combination, provide effective, long-term scenic resource protection.

4. New utility transmission lines, transportation and communication facilities, docks and piers, and repairs and maintenance of existing lines, roads and facilities shall be visually subordinate as seen from key viewing areas to the maximum extent practicable.

5. New buildings shall be prohibited on steeply sloping lands visible from key viewing areas.

6. Proposed projects involving substantial grading on lands visible from key viewing areas shall include a grading plan addressing visual impacts of grading activities. All graded areas shall be revegetated to the maximum extent practicable.

7. Development along the shoreline of the Columbia River and on immediately adjacent lands shall be limited to water-dependent development and water-related recreation development.

8. New production and/or development of mineral resources on sites visible in the foreground or middle ground from key viewing areas shall be permitted if fully screened from view from those key viewing areas. New production and/or development of mineral resources on sites visible in the background from key viewing areas shall be permitted if visually subordinate to its setting as seen from those key viewing areas.

9. Expansion of existing quarries on sites visible from key viewing areas shall be permitted if visually subordinate to its setting as seen from key viewing areas. Existing quarries are those determined not to be discontinued, pursuant to Guideline 4.D in "Existing Uses and Discontinued Uses" (Part II, Chapter 7: General Policies and Guidelines). Expansion refers to lateral expansion (expansion of mining activities into land surfaces previously unaffected by mining).

10. In addition to the guidelines contained in this section, applicable design guidelines specified for a particular landscape setting shall be used to ensure that new development on lands seen from key viewing areas is visually subordinate to its setting in a manner responsive to the unique character of that setting.

11. The Commission and Forest Service shall maintain a *Scenic Resources Implementation Handbook*. The Handbook shall provide specific guidance for applicants and planners in implementing color, reflectivity, landscaping and other guidelines for development on sites visible from key viewing areas. It may be updated as needed, as determined by the Executive Director and Scenic Area Manager. In updating the *Handbook*, the Commission and Forest Service will collaborate with the implementing counties, and solicit other agency and public input.

    The *Handbook* is intended to provide non-exclusive, recommended lists of exterior building materials (for reflectivity) and vegetation species.

GMA Guidelines

1. The guidelines in this section shall apply to proposed developments on sites topographically visible from key viewing areas.

2. Each development shall be visually subordinate to its setting as seen from key viewing areas.

3. Determination of potential visual effects and compliance with visual subordinance policies shall include consideration of the cumulative effects of proposed developments.

4. The extent and type of conditions applied to a proposed development to achieve visual subordinance shall be proportionate to its potential visual impacts as seen from key viewing areas.

    A. Decisions shall include written findings addressing the factors influencing potential visual impact, including but not limited to:

        (1) The amount of area of the building site exposed to key viewing areas.

        (2) The degree of existing vegetation providing screening.

        (3) The distance from the building site to the key viewing areas from which it is visible.

        (4) The number of key viewing areas from which it is visible.

(5) The linear distance along the key viewing areas from which the building site is visible (for linear key viewing areas, such as roads).

B. Conditions may be applied to various elements of proposed developments to ensure they are visually subordinate to their setting as seen from key viewing areas, including but not limited to:

(1) Siting (location of development on the subject property, building orientation, and other elements).

(2) Retention of existing vegetation.

(3) Design (color, reflectivity, size, shape, height, architectural and design details and other elements).

(4) New landscaping.

5. New development shall be sited to achieve visual subordinance from key viewing areas, unless the siting would place such development in a buffer specified for protection of wetlands, riparian corridors, sensitive plants, or sensitive wildlife sites or would conflict with guidelines to protect cultural resources. In such situations, development shall comply with this guideline to the maximum extent practicable.

6. New development shall be sited using existing topography and/or existing vegetation as needed to achieve visual subordinance from key viewing areas.

7. Existing tree cover screening proposed development from key viewing areas shall be retained as specified in the Landscape Settings Design Guidelines section of this chapter.

8. The silhouette of new buildings shall remain below the skyline of a bluff, cliff, or ridge as seen from key viewing areas. Variances to this guideline may be granted if application of the guideline would leave the owner without a reasonable economic use. The variance shall be the minimum necessary to allow the use and may be applied only after all reasonable efforts to modify the design, building height, and site to comply with the guideline have been made.

9. An alteration to a building built before November 17, 1986, that already protrudes above the skyline of a bluff, cliff, or ridge as seen from a key viewing area, may itself protrude above the skyline if:

A. The altered building, through use of color, landscaping and/or other mitigation measures, contrasts less with its setting than before the alteration, and

B. There is no practicable alternative means of altering the building without increasing the protrusion.

10. The following guidelines shall apply to new landscaping used to screen development from key viewing areas:

    A. New landscaping (including new earth berms) shall be required only when application of all other available guidelines in this chapter is not sufficient to make the development visually subordinate from key viewing areas. Alternate sites shall be considered prior to using new landscaping to achieve visual subordinance. Development shall be sited to avoid the need for new landscaping wherever possible.

    B. If new landscaping is required to make a proposed development visually subordinate from key viewing areas, existing on-site vegetative screening and other visibility factors shall be analyzed to determine the extent of new landscaping, and the size of new trees needed to achieve the standard. Any vegetation planted pursuant to this guideline shall be sized to provide sufficient screening to make the development visually subordinate within five years or less from the commencement of construction.

    C. Unless as specified otherwise by provisions in this chapter, landscaping shall be installed as soon as practicable, and prior to project completion. Applicants and successors in interest for the subject parcel are responsible for the proper maintenance and survival of planted vegetation, and replacement of such vegetation that does not survive.

    D. The *Scenic Resources Implementation Handbook* shall include recommended species for each landscape setting consistent with the Landscape Settings Design Guidelines in this chapter, and minimum recommended sizes of new trees planted (based on average growth rates expected for recommended species).

11. Conditions regarding new landscaping or retention of existing vegetation for new developments on lands designated GMA Forest shall meet both scenic guidelines and fuel break requirements in Criterion 1.A of “Approval Criteria for Fire Protection”.

12. Unless expressly exempted by other provisions in this chapter, colors of structures on sites visible from key viewing areas shall be dark earth-tones found at the specific site or in the surrounding landscape. The specific colors or list of acceptable colors shall be included as a condition of approval. The *Scenic Resources Implementation Handbook* will include a recommended palette of colors.

13. The exterior of buildings on lands seen from key viewing areas shall be composed of non-reflective materials or materials with low reflectivity, unless the structure would be fully screened from all key viewing areas by existing topographic features. The *Scenic Resources Implementation Handbook* will include a list of

recommended exterior materials. These recommended materials and other materials may be deemed consistent with this guideline, including those where the specific application meets recommended thresholds in the “Visibility and Reflectivity Matrices” in the *Implementation Handbook* (once they are created). Continuous surfaces of glass unscreened from key viewing areas shall be limited to ensure visual subordinance. Recommended square footage limitations for such surfaces will be provided for guidance in the *Implementation Handbook.*

14. In addition to the site plan requirements in "Review Uses" (Part II, Chapter 7: General Policies and Guidelines), applications for all buildings visible from key viewing areas shall include a description of the proposed building(s)' height, shape, color, exterior building materials, exterior lighting, and landscaping details (type of plants used; number, size, locations of plantings; and any irrigation provisions or other measures to ensure the survival of landscaping planted for screening purposes).

15. For proposed mining and associated activities on lands visible from key viewing areas, in addition to submittal of plans and information pursuant to Guideline 6 in the “Overall Scenic Provisions” section of this chapter, project applicants shall submit perspective drawings of the proposed mining areas as seen from applicable key viewing areas.

16. Exterior lighting shall be directed downward and sited, hooded, and shielded such that it is not highly visible from key viewing areas. Shielding and hooding materials shall be composed of non-reflective, opaque materials.

17. Additions to existing buildings smaller in total square area than the existing building may be the same color as the existing building. Additions larger than the existing building shall be of dark earth-tone colors found at the specific site or in the surrounding landscape. The specific colors or list of acceptable colors shall be included as a condition of approval. The *Scenic Resources Implementation Handbook* will include a recommended palette of colors.

18. Rehabilitation of or modifications to existing significant historic structures shall be exempted from visual subordinance requirements for lands seen from key viewing areas. To be eligible for such exemption, the structure must be included in, or eligible for inclusion in, the National Register of Historic Places or be in the process of applying for a determination of significance pursuant to such regulations. Rehabilitation of or modifications to structures meeting this guideline shall be consistent with National Park Service regulations for such structures.

19. New main lines on lands visible from key viewing areas for the transmission of electricity, gas, oil, other fuels, or communications, except for connections to individual users or small clusters of individual users, shall be built in existing transmission corridors unless it can be demonstrated that use of existing corridors

is not practicable. Such new lines shall be underground as a first preference unless it can be demonstrated to be impracticable.

20. New communication facilities (antennae, dishes, etc.) on lands visible from key viewing areas that require an open and unobstructed site shall be built upon existing facilities unless it can be demonstrated that use of existing facilities is not practicable.

21. New communications facilities may protrude above a skyline visible from a key viewing area only upon demonstration that:

    A. The facility is necessary for public service,

    B. The break in the skyline is seen only in the background, and

    C. The break in the skyline is the minimum necessary to provide the service.

22. Overpasses, safety and directional signs, and other road and highway facilities may protrude above a skyline visible from a key viewing area only upon a demonstration that:

    A. The facility is necessary for public service, and

    B. The break in the skyline is the minimum necessary to provide the service.

23. Except for water-dependent development and for water-related recreation development, development shall be set back 100 feet from the ordinary high water mark of the Columbia River below Bonneville Dam, and 100 feet from the normal pool elevation of the Columbia River above Bonneville Dam, unless the setback would render a property unbuildable. In such cases, variances to this guideline may be authorized.

24. New buildings shall not be permitted on lands visible from key viewing areas with slopes in excess of 30 percent. Variances to this guideline may be authorized if the guideline's application would render a property unbuildable. In determining the slope, the average percent slope of the proposed building site shall be used.

25. Driveways and buildings shall be designed and sited to minimize visibility of cut banks and fill slopes from key viewing areas.

26. All proposed structural development involving more than 200 cubic yards of grading on sites visible from key viewing areas shall include submittal of a grading plan. This plan shall be reviewed by the local government for compliance with key viewing area policies. The grading plan shall include the following:

A. A map of the site, prepared at a scale of 1 inch equals 200 feet (1:2,400) or a scale providing greater detail, with contour intervals of at least 5 feet, including:

(1) Existing and proposed final grades.

(2) Location of all areas to be graded, with cut banks and fill slopes delineated.

(3) Estimated dimensions of graded areas.

B. A narrative description (may be submitted on the grading plan site map and accompanying drawings) of the proposed grading activity, including:

(1) Its purpose.

(2) An estimate of the total volume of material to be moved.

(3) The height of all cut banks and fill slopes.

(4) Provisions to be used for compactions, drainage, and stabilization of graded areas. (Preparation of this information by a licensed engineer or engineering geologist is recommended.)

(5) A description of all plant materials used to revegetate exposed slopes and banks, including the species, number, size, and location of plants, and a description of irrigation provisions or other measures necessary to ensure the survival of plantings.

(6) A description of any other interim or permanent erosion control measures to be used.

27. Expansion of existing quarries and new production and/or development of mineral resources proposed on sites more than 3 miles from the nearest key viewing areas from which it is visible may be allowed upon a demonstration that:

A. The site plan requirements for such proposals pursuant to this chapter have been met.

B. The area to be mined and the area to be used for primary processing, equipment storage, stockpiling, etc. associated with the use would be visually subordinate as seen from any key viewing areas.

C. A reclamation plan to restore the site to a natural appearance that blends with and emulates surrounding landforms to the maximum extent practicable has

been approved. At minimum, the reclamation plan shall comply with Guidelines 6 and 7 in the "Overall Scenic Provisions" section of this chapter.

D. A written report on a determination of visual subordinance has been completed, with findings addressing the extent of visibility of proposed mining activities from key viewing areas, including:

(1) A list of key viewing areas from which exposed mining surfaces (and associated facilities/activities) would be visible.

(2) An estimate of the surface area of exposed mining surfaces that would be visible from those key viewing areas.

(3) The distance from those key viewing areas and the linear distance along those key viewing areas from which proposed mining surfaces are visible.

(4) The slope and aspect of mining surfaces relative to those portions of key viewing areas from which they are visible.

(5) The degree to which potentially visible mining surfaces are screened from key viewing areas by existing vegetation, including winter screening considerations.

(6) The degree to which potentially visible mining surfaces would be screened by new plantings, berms, etc. and appropriate time frames to achieve such results, including winter screening considerations.

28. Unless addressed by Guideline 27 of this section, new production and/or development of mineral resources may be allowed upon a demonstration that:

A. The site plan requirements for such proposals pursuant to this chapter have been met.

B. The area to be mined and the area used for primary processing, equipment storage, stockpiling, etc., associated with the use would be fully screened from any key viewing area.

C. A reclamation plan to restore the area to a natural appearance that blends with and emulates surrounding landforms to the maximum extent practicable has been approved. At minimum, the reclamation plan shall comply with Guidelines 6 and 7 of the "Overall Scenic Provisions" section of this chapter.

29. An interim time period to achieve compliance with visual subordinance requirements for expansion of existing quarries and development of new quarries located more than 3 miles from the nearest visible key viewing area shall be

established before approval. The interim time period shall be based on site-specific topographic and visual conditions, but shall not exceed 3 years beyond the date of approval.

30. An interim time period to achieve compliance with full screening requirements for new quarries located less than 3 miles from the nearest visible key viewing area shall be established before approval. The interim time period shall be based on site-specific topographic and visual conditions, but shall not exceed 1 year beyond the date of approval. Quarrying activity occurring before achieving compliance with full screening requirements shall be limited to activities necessary to provide such screening (creation of berms, etc.).

LANDSCAPE SETTINGS

GMA Goals

1. Maintain the diversity of Gorge landscapes to protect and enhance the Gorge's scenic beauty.

2. Retain the existing character of the Gorge's rural landscapes and two Rural Centers (Corbett and Skamania).

3. Protect existing riverfront landscape settings when providing additional recreational river access and ensure that riverfront recreation is provided in a manner compatible with those settings.

GMA Policies

1. New developments shall be compatible with their landscape setting and maintain the integrity of that setting. Expansion of existing developments shall be compatible with their landscape setting and maintain the integrity of that setting to the maximum extent practicable.

2. These goals, policies, and guidelines apply only to developments and uses subject to review, pursuant to the Management Plan. While agricultural and forest practices influence landscape settings, they are not subject to the goals, policies, and guidelines for landscape settings.

3. Because of the dynamic nature of landscape settings, these settings shall be reevaluated in the periodic plan review process. Substantial changes, particularly with respect to changes of large areas between wooded and agricultural settings, shall be reflected in periodic revisions to the Management Plan.

4. Maintenance of landscape settings shall be a key consideration in determining minimum parcel sizes for GMA land use designations. Recommended minimum parcel sizes for new land divisions to maintain landscape setting character are

included where applicable in the landscape settings descriptions. The Gorge Commission shall use these recommendations when considering minimum parcel sizes for either plan amendments or plan updates.

5. The "Compatible Recreation Use Guidelines" for each landscape setting shall provide the basis for evaluating cumulative effects of recreation proposals on landscape settings, including types and intensities of recreation uses.

GMA Descriptions and Guidelines

Pastoral

Overview and Land Use

Pastoral settings are essentially agrarian in character, typified by areas of pastures and intensive agriculture. This setting includes areas where orchards, vineyards, row crops, and irrigated pasture predominate the landscape. This setting often includes woodlots and scattered rural residential development. Visual features distinguishing this setting include large expanses of cultivated fields and pastures, punctuated by clusters of farm accessory buildings and hedgerows or poplar rows defining distinct fields. Some small parcels with residences occur, but many parcels range between forty and several hundred acres in size.

Landforms

These settings usually occur on level ground or gently rolling terrain. Some of these landscapes are found on relatively flat terraces and benches at the top of steep slopes that form the walls of the Gorge. Other pastoral areas occur in the fertile valleys of the major tributaries flowing into the Columbia River.

Vegetation

Non-native vegetation patterns are predominant. They include alfalfa fields and irrigated pasture, vineyards and fruit orchards, row crops, hedgerows, and poplar rows. Scattered woodlots interspersed throughout this setting reflect the natural vegetation of the portion of the Gorge in which they are located (e.g. Oregon oak and ponderosa pine in the eastern Gorge; Douglas-fir, big leaf maple, and western red cedar in the west).

Compatible Recreation Use Guideline

Resource-based recreation uses of a very low-intensity or low-intensity nature (as defined in the "Recreation Intensity Classes" section of Part I, Chapter 4: Recreation Resources), occurring infrequently in the landscape, are compatible with this setting.

Recommended Parcel Size for New Land Divisions

40 acres.

Design Guidelines

1. Accessory structures, outbuildings, and access ways shall be clustered together as much as possible, particularly towards the edges of existing meadows, pastures, and farm fields.

2. In portions of this setting visible from key viewing areas, the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

    A. Except as is necessary for site development or safety purposes, the existing tree cover screening the development from key viewing areas shall be retained.

    B. Vegetative landscaping shall, where feasible, retain the open character of existing pastures and fields.

    C. At least half of any trees planted for screening purposes shall be species native to the setting or commonly found in the area. Such species include fruit trees, Douglas-fir, Lombardy poplar (usually in rows), Oregon white oak, big leaf maple, and black locust (primarily in the eastern Gorge).

    D. At least one-quarter of any trees planted for screening shall be coniferous for winter screening.

<u>Coniferous Woodland</u>

Overview and Land Use

These are primarily thickly forested areas characterized by forest uses and scattered residential development. Forest uses are often small to moderate in scale, particularly in the more settled portions of this setting. Parcels typically range between 20 and 160 acres in size. Large-scale silvicultural operations also occur in the less developed portions of this setting where land holdings tend to be relatively large (several hundred acres and larger) and residences fairly uncommon.

Landforms

These settings are found in hilly and mountainous portions of the Gorge, particularly on the Washington side of the western Gorge (in the GMA). The more gently rolling and accessible portions of this setting contain small-scale agricultural use and relatively more residences.

Vegetation

This setting is generally dominated by large conifer tree species associated with the ecosystems of the wet western slopes of the Cascades. Such species include Douglas-fir, western hemlock, western red cedar, and grand fir. Deciduous trees frequent the riparian corridors and also cover many slopes in the westernmost portions of the Gorge. Common deciduous species include big leaf maple, red alder, black cottonwood, and various species of willow trees. In the eastern portions of this setting and on dry, south-facing slopes, ponderosa pine and Oregon white oak are also common.

Compatible Recreation Use Guideline

Resource-based recreation uses of varying intensities may be compatible with this setting. Typically, outdoor recreation uses in Coniferous Woodlands are low intensity, and include trails, small picnic areas, and scenic viewpoints. Although infrequent, some more intensive recreation uses, such as campgrounds, occur. They tend to be scattered rather than concentrated, interspersed with large areas of undeveloped land and low-intensity uses.

Recommended Parcel Size for New Land Divisions

20 acres.

Design Guidelines

1. Structure height shall remain below the forest canopy level.

2. In portions of this setting visible from key viewing areas, the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

    A. Except as is necessary for construction of access roads, building pads, leach fields, etc., the existing tree cover screening the development from key viewing areas shall be retained.

    B. At least half of any trees planted for screening purposes shall be species native to the setting. Such species include: Douglas-fir, grand fir, western red cedar, western hemlock, big leaf maple, red alder, ponderosa pine and Oregon white oak, and various native willows (for riparian areas).

    C. At least half of any trees planted for screening purposes shall be coniferous to provide winter screening.

Oak-Pine Woodland

Overview and Land Use

This visually complex setting represents the climatic transition area between the lush forests of the western Gorge and the semi-arid grasslands of the eastern Gorge. Dry oak-pine woods, savannah areas (predominantly grassy openings with scattered trees), and grassy prairies are interspersed with scattered rural development. Such development includes residences, roads, fences, etc. In some portions of this setting, orchards and cultivated areas lend a pastoral flavor to this generally natural-appearing landscape. Most parcels are over 20 acres in size, and are frequently between 40 and 160 acres.

Landforms

Most of this setting is found on gently rolling to hilly terrain. Pastures and small farm uses are interspersed in the gentler portions of this setting. Some very steep slopes and deeply incised side canyons are contained in the least developed portions of this setting.

Vegetation

This setting contains perhaps the most varied vegetative communities in the Gorge, adding to its visual richness. Mixed stands of Oregon white oak and ponderosa pine typify this setting. In the western portions, highest elevations, and north slopes, this community transitions into woodland vegetation patterns, with increasing numbers of Douglas-fir occurring. Drier portions of this setting and areas with poor, thin soils are often treeless prairies. "Biscuit scablands," or patterned ground areas with little vegetation and hummocky rock outcrops, also occur. This special landscape, created by scouring of great floods, is also found in some portions of the Grassland setting.

Compatible Recreation Use Guideline

Resource-based recreation uses of varying intensities may be compatible with this setting, although most are of a low-intensity nature (such as trails or small scenic outlooks). More intensive recreation uses may be compatible where allowed under the "Recreation Intensity Classes" in Part I, Chapter 4, although they are generally rare in this setting. As with Woodland settings, intensive recreation uses in Oak-Pine Woodlands may be compatible if widely scattered and not in large concentrations.

Recommended Parcel Size for New Land Divisions

40 acres.

Design Guidelines

1. Structure height shall remain below the tree canopy level in wooded portions of this setting.

2. In portions of this setting visible from key viewing areas, the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

   A. At least half of any tree species planted for screening purposes shall be species native to the setting. Such species include Oregon white oak, ponderosa pine, and Douglas-fir.

   B. At least half of any trees planted for screening purposes shall be coniferous to provide winter screening.

   For substantially wooded portions:

   C. Except as is necessary for construction of access roads, building pads, leach fields, etc., the existing tree cover screening the development from key viewing areas shall be retained.

   For treeless portions or portions with scattered tree cover:

   D. Structures shall be sited on portions of the property that provide maximum screening from key viewing areas, using existing topographic features.

   E. Patterns of plantings for screening vegetation shall be in character with the surroundings. Residences in grassy, open areas or savannahs shall be partly screened with trees in small groupings and openings between groupings.

   F. Accessory structures, outbuildings, and access ways shall be clustered together as much as possible, particularly towards the edges of existing meadows, pastures, and farm fields.

Grassland

Overview and Land Use

This setting comprises large expanses of generally treeless grass and shrub-covered hills and terraces. It covers most of the eastern fourth of the Scenic Area, stretching from just west of The Dalles to the eastern boundary of the Scenic Area. The dominant land use is cattle ranching, with widely scattered residences, accessory buildings, and related structures associated with ranching. Land holdings are relatively large, commonly ranging from several hundred to several thousand acres in size. The long, unbroken vistas and relatively sparse settlement patterns of this setting give it a dramatic, panoramic character distinct from the rest of the Gorge.

Landforms

The Grassland setting is found on gentle to steeply sloping hillsides and relatively level terraces in the eastern Gorge. The distinctive hummocky terrain of some areas of "biscuit scablands" near Dallesport is also included in this setting. In the extreme eastern portions of the Scenic Area, rugged rocky cliffs along the Columbia River also occur.

Vegetation

Grasses, shrubs, and forbs are predominant in this mostly treeless setting. Introduced grass species cover most of the rangelands, with bitterbrush and sagebrush shrubland occurring in some areas. Some areas of native bunchgrasses and forbs still occur, and some rare plant species are found in a few areas of scablands and vernal ponds. Oregon white oak stands grow in some of the intermittent stream drainages. A few tree species have been widely planted as windbreaks and are naturalized to the area, particularly black locust and poplar. A few vineyards and orchards have been planted in the lower terraces of this setting.

Compatible Recreation Use Guideline

Resource-based recreation uses of a very low-intensity or low-intensity nature that occur infrequently are compatible with this setting, and include hiking, hunting, and wildlife viewing.

Recommended Parcel Size for New Land Divisions

160 acres.

Design Guidelines

1. Accessory structures, outbuildings, and access ways shall be clustered together as much as possible. Exceptions to this guideline are permitted where necessary for farming operations.

2. In portions of this setting visible from key viewing areas, the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

    A. Structures shall be sited on portions of the property that provide maximum screening from key viewing areas, using existing topographic features.

    B. Lower structures that emphasize horizontal lines and blend with this sweeping landscape should be encouraged rather than very tall structures.

C. Planting of trees for screening shall not be extensive, in character with the openness of this setting. Where used, screening vegetation shall either tie in with nearby riparian vegetation in seasonal drainages or emulate windrows. At least half of any trees planted for screening purposes shall be species native to the setting or commonly found in the area. Such species include Oregon white oak, Lombardy poplar, black locust, black cottonwood (wet locations), Russian olive and ponderosa pine.

Rural Residential

Overview and Land Use

Rural Residential settings occur throughout the Scenic Area, consisting of areas primarily committed to single-family residential development. These areas include numerous relatively small parcels, usually ranging between 1 and 5 acres. Because of these densities and the usually small size of these residential enclaves, Rural Residential settings often retain some rural character in contrast to larger, denser residential neighborhoods in the Urban Areas.

Landforms

Rural Residential settings occur in portions of the Gorge landscape that are relatively accessible and lacking in physical development constraints. Most of these areas are gently rolling or level terraces and valley floors. Rural Residential areas are rarely found in steep terrain.

Vegetation

Most Rural Residential settings include numerous plantings of ornamental and other non-native species in residential yards. In some of the less dense Rural Residential areas, remnants of the area's native vegetation have been preserved. In these areas, retention of the native vegetative communities has substantially contributed to the blending of the residential uses with their surroundings.

Compatible Recreation Use Guideline

Compatible recreation uses are usually limited to small community park facilities, but may occasionally include low-intensity resource-based recreation uses (such as small scenic overlooks).

Recommended Parcel Size for New Development

Two acres or 5 acres, depending upon the existing character of the area as reflected in average parcel size and development patterns.

Design Guidelines

1. Existing tree cover shall be retained as much as possible, except as is necessary for site development, safety purposes, or as part of forest management practices.

2. In portions of this setting visible from key viewing areas, and not exempt from visual subordinance guidelines (see "Developed Settings and Visual Subordinance Policies" in this section), the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

   A. Except as is necessary for site development or safety purposes, the existing tree cover screening the development from key viewing areas shall be retained.

   B. At least half of any trees planted for screening purposes shall be species native to the setting or commonly found in the area.

   C. At least half of any trees planted for screening purposes shall be coniferous to provide winter screening.

Rural Residential/Pastoral, Rural Residential/Coniferous Woodland, and Rural Residential/Oak-Pine Woodland

Overview and Land Use

This setting reflects areas that are partly rural residential in nature, yet still substantially retain characteristics of a more rural setting (either Pastoral, Coniferous Woodland or Oak-Pine Woodland).

Such areas are typically composed of a combination of rural residential and small-scale agricultural and forest uses. Parcels in these areas generally range between 5 and 20 acres in size, although some smaller residential lots and a few larger vacant parcels occur.

Landforms

These combination settings generally occur in gentle terrain with relatively good access.

Vegetation

As with Rural Residential settings, natural vegetation patterns have been altered by ornamental and other non-native plantings on residential lots, although to a substantially lesser degree. The Rural Residential/Pastoral settings frequently contain pastures, small orchards, and other characteristic pastoral vegetation elements. Rural Residential/Coniferous Woodland and Rural Residential/Oak-Pine Woodland settings still retain much of the natural vegetative communities. In these settings, residential

development blends with the rural landscape to a greater degree than in Rural Residential settings.

Compatible Recreation Use Guideline

Very low-intensity and low-intensity resource-based recreation uses, scattered infrequently in the landscape, may be compatible with this setting.

Recommended Parcel Size for New Land Divisions

Ten acres or 20 acres, depending upon the existing character of the area, as reflected in average parcel size and development patterns. However, a 10-acre minimum parcel size is recommended for all Rural Residential/Coniferous Woodland settings.

Design Guidelines

1. New development in this setting shall meet the design guidelines described for both the Rural Residential setting and the more rural setting with which it is combined (either Pastoral, Coniferous Woodland or Oak-Pine Woodland), unless it can be demonstrated that compliance with the guidelines for the more rural setting is impracticable. Expansion of existing development shall comply with this guideline to the maximum extent practicable.

2. In the event of a possible conflict between the two sets of guidelines, the guidelines for the more rural setting (Coniferous Woodland, Oak-Pine Woodland or Pastoral) shall apply, unless it can be demonstrated that application of such guidelines would not be practicable.

Residential

Overview and Land Use

A very limited number of areas in the General Management Area already contain dense residential development on parcels of less than 1 acre on the average. These areas, because of their density, size, and proximity to Urban Area development (in all but one case), are essentially suburban in nature and have not retained any rural characteristics. The subdivision north of Chenoweth Creek, known as "Murray's Addition," is the largest of the few Residential settings in the GMA.

Landforms

The Residential settings in the GMA are located on flat or gentle terrain in areas that are readily accessible.

Vegetation

With a few exceptions, natural vegetation patterns in these dense residential areas have been replaced by ornamental and non-native plantings.

Compatible Recreation Use Guideline

Compatible recreation uses are essentially limited to community park facilities.

Design Guidelines

1. In portions of this setting visible from key viewing areas and not exempt from visual subordinance guidelines (see "Developed Settings and Visual Subordinance Policies" in this section), the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

    A. Except as is necessary for site development or safety purposes, the existing tree cover screening the development from key viewing areas shall be retained.

    B. The exteriors of structures shall be non-reflective unless fully screened from key viewing areas with existing vegetation and/or topography.

    C. At least half of any trees planted for screening purposes shall be species native to the setting or commonly found in the area.

    D. At least half of any trees planted for screening purposes shall be coniferous to provide winter screening.

Village

Overview and Land Use

The Village setting applies to the two designated Rural Centers in the GMA (Corbett and Skamania--see Part II, Chapter 5), as well as the Broughton Mill area (approved for a resort by the Gorge Commission in 1989). This setting reflects the nature of the Rural Centers as service centers and gathering places for nearby rural residences. The Village setting contains many small residential parcels and a central core, serving both commercial and social functions. Village settings are distinguished from Rural Residential settings by their mix of residential, institutional (churches, schools, etc.), and commercial uses, creating a small town atmosphere.

Landforms

Village settings have evolved in level or gently rolling areas lacking any substantial physical development constraints or access problems.

Vegetation

Although the Village settings are densely settled relative to the surrounding rural landscape, some areas have retained the natural vegetation of the region in which they are located. Much of the vegetation in this setting, particularly in the Corbett area, consists of non-native species planted by homeowners.

Compatible Recreation Use Guideline

Compatible recreation uses may include community parks serving the recreation needs of local residents, and varying intensities of other recreation uses.

Special Policies for Village Setting

1. The Gorge Commission shall consult with community groups and the appropriate county to refine and revise these design guidelines as appropriate to reflect community desires and interests.

2. The Gorge Commission shall consult with the Oregon Department of Transportation, the Historic Columbia River Highway Advisory Committee, and Multnomah County to define desirable and appropriate provisions for curbs, parking treatments, and access on the Historic Highway.

Design Guidelines

1. New commercial buildings shall be limited in size to a total floor area of 5,000 square feet or less, and shall be limited in height to 2 1/2 stories or less.

2. For new commercial, institutional (churches, schools, government buildings), or multifamily residential uses on parcels fronting a scenic travel corridor (Washington State Route 14 or the Historic Columbia River Highway) and expansion of existing development for such uses, parking shall be limited to rear or side yards of buildings to the maximum extent practicable.

3. New vehicular access points to the scenic travel corridors shall be limited to the maximum extent practicable, and access consolidation shall be required where feasible.

4. New development proposals and expansion of existing development shall be encouraged to follow planned unit development approaches, featuring consolidated access, commonly shared landscaped open areas, etc.

5. New commercial, institutional or multifamily residential uses fronting a scenic travel corridor shall comply with the following landscape requirements:

A. Parking or loading areas for 10 or more spaces shall include a landscaped strip at least 5 feet wide between the new use and the scenic travel corridor roadway.

B. The landscape strip required in Guideline 5.A above, shall include shrubs, vegetative ground cover, and, at minimum, one tree. Trees shall be spaced as appropriate to the species and not to exceed 25 feet apart on the average.

6. The use of building materials that reinforce the Village setting's character, such as wood, logs, or stone, and that reflect community desires, should be encouraged.

7. Architectural styles that are characteristic of the area (such as 1 1/2-story dormer roof styles in Corbett) and that reflect community desires should be encouraged. Entry signs should be consistent with such architectural styles.

8. Design features that create a "pedestrian-friendly" atmosphere, such as large shop windows on the ground floor of commercial buildings, porches along ground floors with street frontage, etc., should be encouraged.

9. Pedestrian walkways and bicycle paths should be encouraged and integrated into new developments wherever feasible.

10. Where feasible, existing tree cover of species native to the region or commonly found in the area shall be retained when designing new development or expanding existing development.

River Bottomlands

Overview and Land Use

This setting includes lush floodplains and riparian forests found along the shores of the Columbia River, particularly below Bonneville Dam. Much of this setting has been lost to dam, freeway and railroad construction. In many places in the GMA, only thin strips of this setting remain, directly adjacent to the river. These remnants are still visually distinct settings that markedly contrast with adjacent rocky slopes or upland conifer forests.

Some of these areas include small pastures and scattered rural residential development, as well as major transportation facilities. This setting also includes major existing park and recreation facilities along the river (e.g. Celilo Park) and the most potentially suitable areas for concentrated public recreational river access, as identified in the planning process.

Landforms

River Bottomlands are, by their nature, confined to flat or gently sloping lands representing remnants of the original Columbia River floodplain.

Vegetation

Where unaltered, this setting consists primarily of a largely deciduous forest, with black cottonwood, red alder, bigleaf maple, and willows dominating. Unforested marshes also occur in this setting, although the largest of these ecologically critical vegetative communities are in the Special Management Area. Major parks in River Bottomlands contain some vegetation patterns uncharacteristic of pristine riparian communities, such as mowed lawn areas and some ornamental plantings. However, to a large degree, the riverfront parks that best blend with the natural surroundings emphasize native species plantings and retention of existing riparian vegetation communities. Thus, the deciduous-dominated riparian species found in River Bottomlands are emphasized as the major vegetation element in the design guidelines applicable to new recreation uses in this setting.

Compatible Recreation Use Guideline

Compatible recreation uses in this setting depend on the degree of natural resource sensitivity of a particular site. In the most critically sensitive River Bottomlands, very low-intensity uses that do not impair wetlands or special habitat requirements may be compatible.

In other River Bottomland areas, nodes of moderate-intensity and/or high-intensity recreation uses may be compatible, provided that: (1) their designs emphasize retention and/or enhancement of native riparian communities, (2) structures and parking areas are visually subordinate, and (3) they are separated from other areas of concentrated recreation usage by stretches of natural-appearing shoreline and adjacent uplands.

Design Guidelines

1. In portions of this setting visible from key viewing areas, the following guidelines shall be employed to achieve visual subordinance for new development and expansion of existing development:

    A. Except as is necessary for site development or safety purposes, existing tree cover screening the development from key viewing areas shall be retained.

    B. At least half of any trees planted for screening purposes shall be species native to the River Bottomland setting. Public recreation developments are encouraged to maximize the percentage of planted screening vegetation native to this setting. Such species include black cottonwood, big leaf maple, red alder, Oregon white ash, Douglas-fir, western red cedar and western hemlock (west Gorge), and various native willow species.

    C. At least one-quarter of any trees planted for screening purposes shall be coniferous for winter screening.

Gorge Walls, Canyons, and Wildlands

Overview and Land Use

This setting represents the bluffs, cliffs and steep slopes that form the walls of the Gorge and the deeply incised canyons of the Columbia River's major tributaries. Because of extreme steepness, and in some cases inaccessibility and instability, these areas are largely undeveloped. They represent some of the most natural settings in GMA lands, despite the proximity of some of these areas to major thoroughfares. Prevailing land use in these areas is undeveloped vacant land, although low-intensity recreation use and some silviculture occur in a few limited areas.

Landform

The landform component of this setting is a much greater determinant of its character than is true for any other setting. Steep wooded slopes, canyon walls, and sheer rock faces characterize this setting. In the side canyons, small ribbons of riparian floodplain areas also occur.

Vegetation

The steepest portions of this setting are rocky cliffs devoid of much vegetation or loose talus slopes with limited vegetation (although such slopes often include large, old fir, pine, and maple trees). Other portions of this setting include stands of large fir and pine trees, some of which appear to be the original forest cover. At the bottom of the Hood, White Salmon, and Little White Salmon River canyons, narrow bands of lush, riparian vegetation are found.

Compatible Recreation Use Guideline

Because of the fragility, steepness, and undeveloped nature of these lands, compatible recreation uses are usually limited to very low-intensity or low-intensity, resource-based activities that focus on enjoyment and appreciation of sensitive resources. Such uses (such as trails) are generally associated with minimal facility development, if any.

Design Guidelines

1. New development and expansion of existing development shall be screened so it is not seen from key viewing areas, to the maximum extent practicable.

2. All trees planted to screen permitted development and uses from key viewing areas shall be native to the area.

3. Existing tree cover shall be retained to the maximum extent practicable, except for the minimum removal necessary to accommodate facilities otherwise permitted in the underlying land use designation or for safety purposes.

4. All buildings shall be limited in height to a maximum of 1 1/2 stories.

5. The exteriors of structures shall be non-reflective.

6. Signage shall be limited to natural materials such as wood or stone, with natural or earth-tone colors, unless public safety concerns or federal or state highway standards require otherwise.

Developed Settings and Visual Subordinance Policies

GMA policies to protect key viewing area viewsheds require that all new development on lands seen from key viewing areas be visually subordinate to its landscape setting, except for "specified developed settings that are not visually sensitive."

Three landscape settings are considered developed settings within this context: Rural Residential, Residential, and Village. Of all GMA lands in these three settings, six particular areas that are not visually sensitive have been identified. New development in these settings shall be compatible with the setting, but not necessarily visually subordinate. New developments in these settings are exempt from the color and siting guidelines in the Key Viewing Areas section of this chapter. These areas are:

1. Corbett Rural Center (Village)

2. Skamania Rural Center (Village)

3. West of Hood River Urban Area, east of Country Club Road (Rural Residential)

4. Murray's Addition subdivision, The Dalles (Residential)

5. Two small areas south of The Dalles in Sections 9 and 10, Township 1N, Range 13E (Residential)

6. Portion of Underwood Heights along Cooper Avenue, south of Cook-Underwood Road (Rural Residential)

SCENIC TRAVEL CORRIDORS

GMA Goal

Designate those portions of the following roads in the Scenic Area as scenic travel corridors and protect and enhance scenic resources within the corridors: Washington State Routes 14, 141, and 142, Interstate 84, the Historic Columbia River Highway (all segments), and Oregon Highway 35.

GMA Objectives

1. Establish coordinated, cooperative implementation programs with the state highway departments, railroads, the Bonneville Power Administration, and utility companies that include protection measures to mitigate visual effects of new corridor development and enhancement measures to reduce visual effects of existing development.

2. Establish a program to provide incentives for landowners or land managers to screen or remove discordant features in the foreground of scenic travel corridors.

3. Encourage communities along scenic travel corridors to enhance the entries to their communities.

4. Encourage the railroads and utility companies to place signal wires and powerlines underground where such features are visually dominant and detract from the visual quality of scenic travel corridors.

5. Encourage the railroads and utility companies to use colors that are visually subordinate on existing equipment along scenic travel corridors.

6. Encourage the Washington and Oregon Departments of Transportation to take the following measures to improve the visual quality of scenic travel corridors:

    A. Place reflectors on guardrails rather than on free-standing posts where feasible and not detrimental to public safety.

    B. Remove unnecessary highway signs and consolidate signs, wherever possible.

    C. Replace sections of white guardrail where white contrasts noticeably with gray or galvanized sections, except along the Historic Columbia River Highway, where two-rail white guardrails are encouraged to emulate historic styles.

    D. Construct berms to emulate natural contours to the maximum extent practicable and eliminate any construction berms that no longer perform any function.

    E. Close unused access roads that no longer provide any service or perform any function and that intersect scenic travel corridors.

    F. Use native plants to the maximum extent practicable when planting any new vegetation in scenic travel corridor rights-of-way.

7. Establish a program to reclaim abandoned quarries in the foreground of scenic travel corridors.

8. Encourage the Bonneville Power Administration to use colors that are visually subordinate on its existing facilities seen from scenic travel corridors.

9. Encourage the Bonneville Power Administration to improve the visual quality of powerline rights-of-way by restoring vegetation to its natural appearance wherever possible.

10. Establish new viewpoints of the Columbia River and lands within the Gorge at places offering outstanding views along scenic travel corridors. (Same as objective 4 under "Scenic Appreciation and Scenic Travel Corridors" in Part I, Chapter 4.)

11. Create or restore openings in vegetation along Washington State Route 14, Interstate 84, and the Historic Columbia River Highway to provide or improve views of the Columbia River and the walls of the Gorge in a manner that does not adversely affect the scenic, cultural, natural, or recreation resources of the Scenic Area. (Same as objective 5 under "Scenic Appreciation and Scenic Travel Corridors" in Part I, Chapter 4.)

12. Encourage the railroads and state departments of transportation to use integrated vegetation management practices in managing vegetation in scenic travel corridor foregrounds.

GMA Policies

1. The *SR 14 Corridor Strategy* (1996) and *I-84 Corridor Strategy* (2005) and associated documents for each shall continue to be implemented (and updated as needed).

2. The goals of scenic corridor strategies shall include: 1) providing a framework for future highway improvements and management that meet Management Plan scenic guidelines and public transportation needs; and 2) creating design continuity for the highway corridor within the Scenic Area. Corridor strategies shall, at minimum, include: a) design guidelines (e.g. materials, conceptual designs, etc.) for typical projects that are consistent with Management Plan scenic resources provisions and b) an interdisciplinary, interagency project planning and development process.

3. Programs and specific provisions developed for scenic travel corridors shall emphasize protection and enhancement of the corridors' foreground.

4. To achieve scenic travel corridor objective 1, above, the Gorge Commission shall consider establishing an interagency Scenic Travel Corridor Implementation Task

Force, to be composed of representatives of all entities referenced in objective 1, as well as local and Indian tribal government representatives.

5. New structural development, other than access roads, pathways, or necessary signage, shall be limited in the immediate foreground of scenic travel corridors. Expansion of existing development shall comply with this policy to the maximum extent practicable.

6. New production and/or development of mineral resources may be permitted in the foregrounds of scenic travel corridors upon a demonstration that such uses would be fully screened from view of the corridor roadway itself. Expansion of existing quarries in the foregrounds of scenic travel corridors may be permitted if determined to be visually subordinate.

7. A reclamation plan shall be required for expansion of existing quarries and all new mining activity within scenic travel corridors, including quarries for which no reclamation program is required by the laws of Washington or Oregon.

8. New signal wires and powerlines along scenic travel corridors shall be placed underground to the maximum extent practicable in areas where above-ground facilities would be visually dominant and detract from corridor visual quality.

9. New mailboxes and newspaper boxes along scenic travel corridors shall be clustered to the maximum extent practicable.

10. New residential and commercial driveway access to scenic travel corridors shall be consolidated to the maximum extent practicable.

11. New road cuts shall be contoured to approximate a natural-appearing grade and vegetated with species native or naturalized to the area in order to blend with the landscape setting.

GMA Guidelines

1. For the purposes of implementing this section, the foreground of a scenic travel corridor shall include those lands within 1/4 mile of the edge of pavement of the scenic travel corridor roadway.

2. All new buildings and alterations to existing buildings shall be set back at least 100 feet from the edge of pavement of the scenic travel corridor roadway. This policy shall not apply in Rural Center designations (Village landscape setting). A variance to this setback requirement may be granted pursuant to Guideline 2 in "Variances from Setbacks and Buffers" (Part II, Chapter 7: General Policies and Guidelines). All new parking lots and expansions of existing parking lots shall be set back at least 100 feet from the edge of pavement of the scenic travel corridor roadway, to the maximum extent practicable.

3. Additions to existing buildings or expansion of existing parking lots located within 100 feet of the edge of pavement of a scenic travel corridor roadway shall comply with Guideline 2 of this section to the maximum extent practicable. This guideline shall not apply in Rural Center designations (Village landscape setting).

4. All proposed vegetation management projects in public rights-of-way to provide or improve views shall include the following:

   A. An evaluation of potential visual impacts of the proposed project as seen from any key viewing area.

   B. An inventory of any rare plants, sensitive wildlife habitat, wetlands, or riparian areas on the project site. If such resources are determined to be present, the project shall comply with applicable Management Plan guidelines to protect the resources.

5. When evaluating possible locations for undergrounding of signal wires or powerlines, railroads and utility companies shall prioritize those areas specifically recommended as extreme or high priorities for undergrounding in the *Columbia River Gorge National Scenic Area Corridor Visual Inventory* (April 1990).

6. New production and/or development of mineral resources proposed within 1/4 mile of the edge of pavement of a scenic travel corridor may be allowed upon a demonstration that full visual screening of the site from the scenic travel corridor can be achieved by use of existing topographic features or existing vegetation designed to be retained through the planned duration of the proposed project. An exception to this may be granted if planting of new vegetation in the vicinity of the access road to the mining area would achieve full screening. If existing vegetation is partly or fully employed to achieve visual screening, over 75 percent of the tree canopy area shall be coniferous species providing adequate winter screening. Mining and associated primary processing of mineral resources is prohibited within 100 feet of a scenic travel corridor, as measured from the edge of pavement, except for access roads. Compliance with full screening requirements shall be achieved within timeframes specified in Guideline 30 of the "Key Viewing Areas" section of this chapter.

7. Expansion of existing quarries may be allowed pursuant to Guideline 27 in the "Key Viewing Areas" section of this chapter. Compliance with visual subordinance requirements shall be achieved within timeframes specified in Guideline 29 of the "Key Viewing Areas" section of this chapter.

SIGNS

GMA Goal

Protect and enhance scenic resources by minimizing visual impacts of signage, while authorizing signage necessary for commerce, recreation, safety, and public information.

GMA Objective

Encourage the use of the Columbia River Gorge National Scenic Area Graphic Signing System for public signs in and adjacent to public rights-of-way.

GMA Policies

1. New signs within state and federal highway rights-of-way shall comply with the standards of the Columbia River Gorge National Scenic Area Graphic Signing System. Exceptions may be granted if necessary for public safety, traffic control, or highway construction signs when the Graphic Signing System conflicts with the requirements of the *Manual for Uniform Traffic Control Devices*.

2. New signs shall be designed and sited in a manner that achieves their intended function and is compatible with their settings, to the maximum extent practicable.

3. Guidelines for alteration and amortization of nonconforming signs shall be employed to bring such signage into conformance with the provisions of this section.

GMA Guidelines

1. Except for signs allowed without review pursuant to “Uses Allowed Outright” (Part II, Chapter 7: General Policies and Guidelines), all new signs must meet the following guidelines unless these guidelines conflict with the *Manual for Uniform Traffic Control Devices* for public safety, traffic control or highway construction signs. In such cases, the standards in the *Manual for Uniform Traffic Control Devices* shall supersede these guidelines.

    A. The support structure shall be unobtrusive and have low visual impact.

    B. Lettering colors with sufficient contrast to provide clear message communication shall be allowed. Signs shall be colored to blend with their setting to the maximum extent practicable.

    C. Backs of all signs shall be unobtrusive, non-reflective, and blend in with the setting.

D. Spotlighting of signs may be allowed where needed for night visibility. Backlighting is not permitted for signs.

E. Except for signs along public highways necessary for public safety, traffic control, or road construction and consistent with the *Manual for Uniform Traffic Control Devices*, the following signs are prohibited:

(1) Luminous signs or those with intermittent or flashing lights. These include neon signs, fluorescent signs, light displays, and other signs that are internally illuminated, exclusive of seasonal holiday light displays.

(2) New billboards.

(3) Signs with moving elements.

(4) Portable or wheeled signs, or signs on parked vehicles where the sign is the primary use of the vehicle.

2. Any sign that does not conform with a provision of these guidelines and has existed before their adoption is subject to the following provisions:

A. Alteration of existing nonconforming signs shall comply with these guidelines.

B. Any nonconforming sign used by a business must be brought into conformance concurrent with any expansion or change in use that requires a development permit.

SMA PROVISIONS

SMA Goal

Protect and enhance scenic resources.

SMA Policies

1. The appearance and character of the Landscape Settings within the SMA shall be protected. (Character is defined as the land use, landform and vegetation as described in the GMA Scenic Resources section of this chapter).

2. In developing conditions of approval, agencies shall emphasize those elements that, in combination, provide effective, long-term scenic resource protection.

3. The Forest Service Visual Quality Objective system shall be the basis for setting scenic standards to evaluate all new developments and land uses topographically visible from key viewing areas. Each landscape setting will be assigned specific scenic standards.

4. Size, scale, shape, color, texture, siting, height, building materials, lighting, or other visual aspects shall be regulated to protect the scenic resources.

5. New developments and land uses occurring in the foreground of key viewing areas shall protect scenic values.

6. Rehabilitation or modification of historic structures on or eligible for the National Register of Historic Places may be exempt from the above policies if such modification is in compliance with the National Register of Historic Places guidelines.

7. The Historic Columbia River Highway, Washington State Route 14, Interstate 84, the Larch Mountain Road, the Wyeth Bench Road, and Klickitat County Road 1230 shall be managed as scenic routes.

8. The Commission and Forest Service shall maintain a *Scenic Resources Implementation Handbook,* to be approved by the Executive Director and Scenic Area Manager. The Handbook shall provide specific guidance for applicants and planners in implementing color, reflectivity, landscaping and other guidelines for development on sites visible from key viewing areas. In maintaining the *Handbook*, the Commission and Forest Service will collaborate with the implementing counties, and solicit other agency and public input.

   The *Handbook* is intended to provide non-exclusive, recommended lists of exterior building materials (for reflectivity) and vegetation species.

SMA Design Guidelines Based on Landscape Settings

1. The following guidelines apply to all lands within SMA landscape settings regardless of visibility from KVAs (includes areas seen from KVAs as well as areas not seen from KVAs):

   A. Pastoral: Pastoral areas shall retain the overall appearance of an agricultural landscape.

      (1) The use of plant species common to the landscape setting shall be encouraged. The use of plant species in rows, as commonly found in the landscape setting, is encouraged.

   B. Coniferous Woodland and Oak-Pine Woodland: Woodland areas shall retain the overall appearance of a woodland landscape. New developments and land uses shall retain the overall visual character of the natural appearance of the Coniferous Woodland and Oak-Pine Woodland landscape.

      (1) Buildings shall be encouraged to have a vertical overall appearance in the Coniferous Woodland landscape setting and a horizontal overall appearance in the Oak-Pine Woodland landscape setting.

      (2) Use of plant species native to the landscape setting shall be encouraged. Where non-native plants are used, they shall have native-appearing characteristics.

   C. Residential: The Residential setting is characterized by concentrations of dwellings.

      (1) At Rowena Dell, new buildings shall have a rustic appearance using natural materials. At Latourell Falls, new buildings shall have an appearance consistent with the predominant historical architectural style.

      (2) Use of plant species native to the landscape setting shall be encouraged. Where non-native plants are used, they shall have native-appearing characteristics.

   D. River Bottomlands: River Bottomlands shall retain the overall visual character of a floodplain and associated islands.

      (1) Buildings shall have an overall horizontal appearance in areas with little tree cover.

      (2) Use of plant species native to the landscape setting shall be encouraged. Where non-native plants are used, they shall have native-appearing characteristics.

E. Gorge Walls, Canyonlands, and Wildlands: New developments and land uses shall retain the overall visual character of the natural-appearing landscape.

(1) Structures, including signs, shall have a rustic appearance, use non-reflective materials, have low contrast with the surrounding landscape, and be of a Cascadian architectural style.

(2) Temporary roads shall be promptly closed and revegetated.

(3) New utilities shall be below ground surface, where feasible.

(4) Use of plant species non-native to the Columbia River Gorge shall not be allowed.

SMA Guidelines for Development and Uses Visible from KVAs

1. The guidelines in this section shall apply to proposed developments on sites topographically visible from key viewing areas.

2. New developments and land uses shall be evaluated to ensure that the required scenic standard is met and that scenic resources are not adversely affected, including cumulative effects, based on the degree of visibility from key viewing areas.

3. The required SMA scenic standards for all development and uses are summarized in the following table:

REQUIRED SMA SCENIC STANDARDS		
LANDSCAPE SETTING	**LAND USE DESIGNATION**	**SCENIC STANDARD**
Coniferous Woodland, Oak-Pine Woodland	Forest (National Forest Lands), Open Space	Not Visually Evident
River Bottomlands	Open Space	Not Visually Evident
Gorge Walls, Canyonlands, Wildlands	Forest, Agriculture, Public Recreation, Open Space	Not Visually Evident
Coniferous Woodland, Oak-Pine Woodland	Forest, Agriculture, Residential, Public Recreation	Visually Subordinate
Residential	Residential	Visually Subordinate
Pastoral	Forest, Agriculture, Public Recreation, Open Space	Visually Subordinate
River Bottomlands	Forest, Agriculture, Public Recreation	Visually Subordinate

4. In all landscape settings, scenic standards shall be met by blending new development with the adjacent natural landscape elements rather than with existing development.

5. Proposed developments or land uses shall be sited to achieve the applicable scenic standard. Development shall be designed to fit the natural topography, to take advantage of landform and vegetation screening, and to minimize visible grading or other modifications of landforms, vegetation cover, and natural characteristics. When screening of development is needed to meet the scenic standard from key viewing areas, use of existing topography and vegetation shall be given priority over other means of achieving the scenic standard such as planting new vegetation or using artificial berms.

6. The extent and type of conditions applied to a proposed development or use to achieve the scenic standard shall be proportionate to its degree of visibility from key viewing areas.

   A. Decisions shall include written findings addressing the factors influencing the degree of visibility, including but not limited to:

      (1) The amount of area of the building site exposed to key viewing areas,

      (2) The degree of existing vegetation providing screening,

      (3) The distance from the building site to the key viewing areas from which it is visible,

      (4) The number of key viewing areas from which it is visible, and

      (5) The linear distance along the key viewing areas from which the building site is visible (for linear key viewing areas, such as roads).

   B. Conditions may be applied to various elements of proposed developments to ensure they meet the scenic standard for their setting as seen from key viewing areas, including but not limited to:

      (1) Siting (location of development on the subject property, building orientation, and other elements),

      (2) Retention of existing vegetation,

      (3) Design (color, reflectivity, size, shape, height, architectural and design details and other elements), and

      (4) New landscaping.

7. Sites approved for new development to achieve scenic standards shall be consistent with guidelines to protect wetlands, riparian corridors, sensitive plant or wildlife sites and the buffer zones of each of these natural resources, and guidelines to protect cultural resources.

8. Proposed developments shall not protrude above the line of a bluff, cliff, or skyline as seen from key viewing areas.

9. Structure height shall remain below the average tree canopy height of the natural vegetation adjacent to the structure, except if it has been demonstrated that meeting this guideline is not feasible considering the function of the structure.

10. The following guidelines shall apply to new landscaping used to screen development from key viewing areas:

    A. New landscaping (including new earth berms) to achieve the required scenic standard from key viewing areas shall be required only when application of all other available guidelines in this chapter is not sufficient to make the development meet the scenic standard from key viewing areas. Development shall be sited to avoid the need for new landscaping wherever possible.

    B. If new landscaping is necessary to meet the required standard, existing on-site vegetative screening and other visibility factors shall be analyzed to determine the extent of new landscaping, and the size of new trees needed to achieve the standard. Any vegetation planted pursuant to this guideline shall be sized to provide sufficient screening to meet the scenic standard within five years or less from the commencement of construction.

    C. Landscaping shall be installed as soon as practicable, and prior to project completion. Applicants and successors in interest for the subject parcel are responsible for the proper maintenance and survival of planted vegetation, and replacement of such vegetation that does not survive.

    D. The *Scenic Resources Implementation Handbook* shall include recommended species for each landscape setting consistent with the Landscape Settings Design Guidelines in this chapter, and minimum recommended sizes of new trees planted (based on average growth rates expected for recommended species).

11. Unless expressly exempted by other provisions in this chapter, colors of structures on sites visible from key viewing areas shall be dark earth-tones found at the specific site or the surrounding landscape. The specific colors or list of acceptable colors shall be included as a condition of approval. The *Scenic Resources Implementation Handbook* shall include a recommended palette of colors as dark or darker than the colors in the shadows of the natural features surrounding each landscape setting.

12. The exterior of structures on lands seen from key viewing areas shall be composed of non-reflective materials or materials with low reflectivity. The *Scenic Resources Implementation Handbook* shall include a recommended list of exterior materials. These recommended materials and other materials may be deemed consistent with this guideline, including those where the specific application meets approval thresholds in the "Visibility and Reflectivity Matrices" in the Implementation Handbook. Continuous surfaces of glass unscreened from key viewing areas shall be limited to ensure meeting the scenic standard. Recommended square footage limitations for such surfaces will be provided for guidance in the Implementation Handbook.

13. Any exterior lighting shall be sited, limited in intensity, shielded, or hooded in a manner that prevents lights from being highly visible from key viewing areas and from noticeably contrasting with the surrounding landscape setting, except for road lighting necessary for safety purposes.

14. Seasonal lighting displays shall be permitted on a temporary basis, not to exceed 3 months.

SMA Guidelines for KVA Foregrounds and Scenic Routes

1. All new developments and land uses immediately adjacent to scenic routes shall be in conformance with state or county scenic route guidelines.

2. Scenic highway corridor strategies shall be developed and implemented for Interstate 84 (I-84), Washington State Route 14 (SR 14) and the Historic Columbia River Highway (HCRH). For I-84, SR 14 and the HCRH, this involves ongoing implementation (and possible updating) of the associated existing documents.

3. The goals of scenic corridor strategies shall include: 1) providing a framework for future highway improvements and management that meet Management Plan scenic guidelines and public transportation needs; and 2) creating design continuity for the highway corridor within the Scenic Area. Corridor strategies shall, at minimum, include design guidelines (e.g. materials, conceptual designs, etc.) for typical projects that are consistent with Management Plan scenic resources provisions and an interdisciplinary, interagency project planning and development process.

4. The following guidelines shall apply only to development within the immediate foregrounds of key viewing areas. Immediate foregrounds are defined as within the developed prism of a road or trail KVA or within the boundary of the developed area of KVAs such as Crown Pt. and Multnomah Falls. They shall apply in addition to applicable guidelines in the previous section (**SMA Guidelines for Development Visible from KVAs**).

A. The proposed development shall be designed and sited to meet the applicable scenic standard from the foreground of the subject KVA. If the development cannot meet the standard, findings must be made documenting why the project cannot meet the requirements in the previous section and why it cannot be redesigned or wholly or partly relocated to meet the scenic standard.

B. Findings must evaluate the following:

(1) The limiting factors to meeting the required scenic standard and/or applicable guidelines from the previous section;

(2) Reduction in project size;

(3) Options for alternative sites for all or part of the project, considering parcel configuration and on-site topographic or vegetative screening;

(4) Options for design changes including changing the design shape, configuration, color, height, or texture in order to meet the scenic standard.

C. Form, line, color, texture, and design of a proposed development shall be evaluated to ensure that the development blends with its setting as seen from the foreground of key viewing areas:

(1) **Form and Line**-Design of the development shall minimize changes to the form of the natural landscape. Development shall borrow form and line from the landscape setting and blend with the form and line of the landscape setting. Design of the development shall avoid contrasting form and line that unnecessarily call attention to the development.

(2) **Color**-Color shall be found in the project's surrounding landscape setting. Colors shall be chosen and repeated as needed to provide unity to the whole design.

(3) **Texture**-Textures borrowed from the landscape setting shall be emphasized in the design of structures. Landscape textures are generally rough, irregular, and complex rather than smooth, regular, and uniform.

(4) **Design**-Design solutions shall be compatible with the natural scenic quality of the Gorge. Building materials shall be natural or natural appearing. Building materials such as concrete, steel, aluminum, or plastic shall use form, line color and texture to harmonize with the natural environment. Design shall balance all design elements into a harmonious whole, using repetition of elements and blending of elements as necessary.

5. Right-of-way vegetation shall be managed to minimize visual impacts of clearing and other vegetation removal as seen from key viewing areas. Roadside vegetation management (vista clearing, planting, etc.) should enhance views from the highway.

6. Screening from key viewing areas shall be encouraged for existing and required for new road maintenance, warehouse, and stockpile areas.

SMA Guidelines for Areas Not Seen from KVAs

1. Unless expressly exempted by other provisions in this chapter, colors of structures on sites not visible from key viewing areas shall be earth-tones found at the specific site. The specific colors or list of acceptable colors shall be approved as a condition of approval, drawing from the recommended palette of colors included in the *Scenic Resources Implementation Handbook*.

CHAPTER

2

Cultural Resources

Cultural resources are the evidence of past human activity that are important in the history, archaeology, architecture, or culture of a community or region. (A complete definition appears in the glossary.) They can be divided into three groups:

Archaeological resources: Physical remains or ruins of past generations, such as the remains of a rock shelter, an Indian village, or a pioneer settlement. Other examples include rock art, graves, and artifacts such as arrowheads and utensils.

Historic buildings and structures: Standing buildings and structures that are at least 50 years old, including log cabins, barns, highways, and wagon trails.

Traditional cultural properties: Objects and places associated with beliefs and practices of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Traditional cultural properties may include a location used by past and present generations of Native Americans for ceremonial purposes or an area where a community has traditionally conducted culturally important economic or artistic activities.

A rich and diverse array of cultural resources exists in the Scenic Area. The cultural resources range from 10,000-year-old stone tools to log cabins built by pioneers to vision quest sites still used today by Native Americans.

SCENIC AREA ACT PROVISIONS

One purpose of the Scenic Area Act is to "protect and provide for the enhancement of the. . . cultural. . . resources of the Columbia River Gorge" [Section 3(1)].

The Scenic Area Act authorizes the Gorge Commission and the Forest Service to protect cultural resources by using guidelines and the Open Space designation (see Part II, Chapter 4). The guidelines must require new commercial and residential uses, mineral operations, and other types of development to occur without adversely affecting cultural resources [Section 6(d)]. The Scenic Area Act defines "adversely affect" to mean a "reasonable likelihood of more than moderate adverse consequences for. . . cultural. . . resources" [Section 2(a)].

The Scenic Area Act directs the Gorge Commission and Forest Service to

"protect and enhance open spaces" [Section 6(d)(3)].

Open spaces include cultural and historic areas, archaeological sites, Indian burial grounds, village sites, historic trails and roads, and other areas that are culturally and historically significant [Section 2(l)].

KEY ISSUES

Cultural resources are important. They allow people to learn firsthand about prehistory and history, and contribute useful insight about our physical and cultural evolution. Some cultural resources are associated with traditional beliefs of social and cultural groups. They are vital to protecting the religious freedom and cultural identity of these groups.

Cultural resources can be destroyed by human activities, particularly new development that disturbs the ground. State laws in Oregon and Washington offer limited protection to cultural resources. The laws do not become effective until the presence of a cultural resource site is known. Yet, they do not require cultural resource surveys to be conducted before development begins.

Archaeologists and historians estimate that less than 10 percent of the Scenic Area has been inventoried for cultural resources. The existing inventories include only a few of the cultural resource sites thought to exist in the Scenic Area. As a result, archaeological resources and traditional cultural properties are often discovered after a project has been approved and construction has begun. This results in costly delays to developers and irreparable damage to cultural resources.

OVERVIEW OF CULTURAL RESOURCES PROVISIONS

The GMA provisions in this chapter apply to all development on public and private lands in the GMA, as well as to non-federal development in the SMA. The SMA provisions apply to developments on federal lands, federally assisted projects, and forest practices that occur in the SMA.

The GMA provisions employ a four-step process to protect cultural resources. This process entails:

- Requiring cultural resource surveys before some new developments are approved. Survey requirements are waived for developments that would have little or no effect on cultural resources, such as activities that do not disturb the ground or alter structures that are less than 50 years old.

- Evaluating the significance of any resources discovered during the surveys.

- Assessing and documenting the effects of the proposed development on cultural resources.

- Preparing mitigation plans to avoid impacts to resources.

These steps require consultation with Indian tribal governments, social and cultural groups, and interested persons.

The SMA provisions will have little effect on federal or federally assisted

developments. These developments must continue to comply with Section 106 of the Historic Preservation Act of 1966. The provisions for the SMA do contain specific guidelines for literature reviews, tribal consultation, and cultural resource surveys. Both the GMA and SMA parts of this chapter contain guidelines to halt a project if cultural resources are discovered during construction. In such case, survey, evaluation, assessment, and mitigation plans would be required before construction could continue. To respect Native American culture, the guidelines also detail how human remains discovered during construction will be treated.

GMA PROVISIONS

GMA Goals

1. Protect and enhance cultural resources.

2. Ensure that proposed uses do not have an adverse effect on significant cultural resources.

GMA Objectives

1. Survey all lands in the GMA for cultural resources as soon as funds are available. The Gorge Commission shall facilitate a multiparty effort to seek funds for such a survey. The parties should include Indian tribal and local governments and state and federal agencies. The first phase of the inventory should consist of a Native American oral history program.

2. Update the cultural resources inventory as new cultural resources are discovered. The update shall be conducted by the Gorge Commission.

3. Establish a Cultural Advisory Committee (CAC) to monitor the cultural resource protection process and provide technical assistance to local governments and landowners.

4. Promote educational programs and incentives that encourage landowners and agency officials to voluntarily protect and enhance cultural resources.

GMA Policies

1. Generally, well-defined geographic areas that possess large concentrations of cultural resources shall be designated Open Space.

2. Information regarding the nature and location of archaeological resources and cultural resources associated with Native Americans shall be kept confidential to avoid unlawful, malicious, or negligent disturbance.

3. A four-step process shall be used to protect cultural resources: performing cultural resource reconnaissance or historic surveys before proposed uses are authorized; evaluating the significance of cultural resources discovered during surveys; assessing the effects of proposed uses on significant cultural resources; and preparing mitigation plans to avoid or minimize impacts to significant cultural resources.

4. All cultural resource surveys, evaluations, assessments, and mitigation plans shall be performed by professionals whose expertise reflects the type of cultural resources that are involved. Principal investigators shall meet the professional standards published 36 Code of Federal Regulations (CFR) Part 61 and *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King, no date).

5. Cultural resource surveys, evaluations, assessments, and mitigation plans shall generally be conducted in consultation with Indian tribal governments and any person who submits written comments on a proposed use (interested person). Indian tribal governments shall be consulted if the affected cultural resources are prehistoric or otherwise associated with Native Americans.

6. The reconnaissance survey guidelines below shall apply until a cultural resource survey of the GMA is complete.

   A. A reconnaissance survey shall be required for all proposed uses, except:

      (1) The modification, expansion, replacement, or reconstruction of existing buildings and structures.

      (2) Proposed uses that would not disturb the ground, including land divisions and lot-line adjustments; storage sheds that do not require a foundation; low-intensity recreation uses, such as fishing, hunting, and hiking; installation of surface chemical toilets; hand treatment of brush within established rights-of-way; and new uses of existing structures.

      (3) Proposed uses that involve minor ground disturbance, as defined by depth and extent, including repair and maintenance of lawfully constructed and serviceable structures; home gardens; livestock grazing; cultivation that employs minimum tillage techniques, such as replanting pastures using a grassland drill; construction of fences; new utility poles that are installed using an auger, post-hole digger, or similar implement; and placement of mobile homes where septic systems and underground utilities are not involved.

The Gorge Commission shall review all land use applications and determine if proposed uses would have a minor ground disturbance.

(4) Proposed uses that occur on sites that have been disturbed by human activities, provided the proposed uses do not exceed the depth and extent of existing ground disturbance. To qualify for this exception, a project applicant must demonstrate that land-disturbing activities occurred in the project area. Land-disturbing activities include grading and cultivation.

(5) Proposed uses that would occur on sites that have been adequately surveyed in the past.

The project applicant must demonstrate that the project area has been adequately surveyed to qualify for this exception. Past surveys must have been conducted by a qualified professional and must include a surface survey and subsurface testing. The nature and extent of any cultural resources in the project area must be adequately documented.

(6) Proposed uses occurring in areas that have a low probability of containing cultural resources, except:

(a) Residential development that involves two or more new dwellings for the same project applicant.

(b) Recreation facilities that contain parking areas for more than 10 cars, overnight camping facilities, boat ramps, and visitor information and environmental education facilities.

(c) Public transportation facilities that are outside improved rights-of-way.

(d) Electric facilities, lines, equipment, and appurtenances that are 33 kilovolts or greater.

(e) Communications, water and sewer, and natural gas transmission (as opposed to distribution) lines, pipes, equipment, and appurtenances.

Areas that have a low probability of containing cultural resources shall be identified using the results of reconnaissance surveys conducted by the Gorge Commission, the Forest Service, public agencies, and private archaeologists.

The Gorge Commission, after consulting Indian tribal governments and state historic preservation officers, shall prepare and adopt a map

showing areas that have a low probability of containing cultural resources. This map shall be adopted within 200 days after the Secretary of Agriculture concurs with the Management Plan. It shall be refined and revised as additional reconnaissance surveys are conducted. Areas shall be added or deleted as warranted. All revisions of this map shall be reviewed and approved by the Gorge Commission.

B. A reconnaissance survey shall be required for all proposed uses within 500 feet of a known cultural resource, including those uses listed above in 6.A(1) through (6). The locations of known cultural resources are shown in the cultural resource inventory prepared by Heritage Research Associates and maintained by the USDA Forest Service for the Columbia River Gorge Commission.

7. A historic survey shall be required for all proposed uses that would alter the exterior architectural appearance of buildings and structures that are 50 years old or older, or would compromise features of the surrounding area that are important in defining the historic or architectural character of buildings or structures that are 50 years old or older.

8. The Gorge Commission shall conduct and pay for all reconnaissance and historic surveys for small-scale uses in the GMA. When archaeological resources or traditional cultural properties are discovered, the Gorge Commission also shall identify the approximate boundaries of the resource or property and delineate a reasonable buffer zone. Reconnaissance surveys and buffer zone delineations for large-scale uses shall be the responsibility of the project applicant.

   The Gorge Commission shall conduct and pay for evaluations of significance and mitigation plans for cultural resources that are discovered during construction of small-scale and large-scale uses in the GMA.

   For the Management Plan, large-scale uses include residential development involving two or more new dwellings; all recreation facilities; commercial and industrial development; public transportation facilities; electric facilities, lines, equipment, and appurtenances that are 33 kilovolts or greater; and communications, water and sewer, and natural gas transmission (as opposed to distribution) lines, pipes, equipment, and appurtenances.

9. The responsibility and cost of preparing an evaluation of significance, assessment of effect, or mitigation plan shall be borne by the project applicant, except for resources discovered during construction.

10. If cultural resources may be affected by a proposed use, an evaluation shall be performed to determine if they are significant. Cultural resources are significant if one of the following criteria is satisfied:

A. The cultural resources are included in, or eligible for inclusion in, the National Register of Historic Places.

The criteria for evaluating the eligibility of cultural resources for the National Register of Historic Places appear in the "National Register Criteria for Evaluation" (36 CFR 60.4). Cultural resources are eligible for the National Register of Historic Places if they possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, they must meet one or more of the following criteria:

(1) Have an association with events that have made a significant contribution to the broad patterns of the history of this region.

(2) Have an association with the lives of persons significant in the past.

(3) Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction.

(4) Yield, or may be likely to yield, information important in prehistory or history.

B. The cultural resources are determined to be culturally significant by an Indian tribal government, based on criteria developed by that Indian tribal government and filed with the Gorge Commission.

11. If a project applicant's and Indian tribal government's evaluations of significance contradict, the Cultural Advisory Committee (CAC) shall review the applicant's evaluation and Indian tribal government's substantiated concerns. The CAC will submit a recommendation to the local government as to whether affected cultural resources are significant.

12. If cultural resources are determined to be significant, there shall be a professional assessment of the effects of the proposed use. The assessment shall be based on the criteria published in "Protection of Historic Properties" (36 CFR 800.5).

13. A mitigation plan shall be prepared if a proposed use would have an adverse effect on significant cultural resources. The criteria published in “Resolution of Adverse Effects” (36 CFR 800.6) shall be used to determine if a proposed use would have an adverse effect.

14. Mitigation measures shall ensure that a proposed use would have no adverse effect on significant cultural resources. Uses that would adversely affect significant cultural resources shall be prohibited.

15. Avoidance is the preferred method of cultural resource protection. Other mitigation measures to reduce the effect of a proposed use on cultural resources shall be used only if avoidance is not practicable.

16. The state historic preservation officer (SHPO) shall have an opportunity to review all cultural resource surveys, evaluations, assessments, and mitigation plans. Based on comments submitted by the SHPO and interested persons, the local government shall make a final decision on whether the proposed use would be consistent with the cultural resource goals, policies, and guidelines.

17. The SHPO may delegate all or a portion of his/her responsibilities under these goals, objectives, policies, and guidelines to a local government that establishes a Certified Local Government, as provided in the National Historic Preservation Act of 1966.

18. If cultural resources are discovered during construction activities, all construction shall cease until the resources are inventoried and evaluated. If the resources are determined to be significant, a mitigation plan shall be prepared.

19. If human remains are discovered during a cultural resource survey or during construction activities, all activities shall cease and the proper officials and governments shall be notified. Human remains shall be treated in accordance with state laws. A mitigation plan shall be prepared if the remains are reinterred or preserved in their original position.

20. Provide incentives to protect and enhance historically significant buildings by allowing uses of such buildings that are compatible with their historic character and that provide public appreciation and enjoyment of them as cultural resources.

GMA Guidelines

Determination of potential effects to significant cultural resources shall include consideration of cumulative effects of proposed developments that are subject to any of the following: 1) a reconnaissance or historic survey; 2) a determination of significance; 3) an assessment of effect; or 4) a mitigation plan. *(Added: CRGC adoption 7/13/10; U.S. Sec. Ag. concurrence 11/1/10)*

Cultural Resource Reconnaissance and Historic Surveys

Gorge Commission/Tribal Government Notice

1. In addition to other public notice requirements that may exist, local governments shall notify the Indian tribal governments when (1) a reconnaissance survey is required or (2) cultural resources that are prehistoric or otherwise associated with Native Americans exist in the project area. Notices sent to Indian tribal governments shall include a site plan.

2. Indian tribal governments shall have 20 calendar days from the date a notice is mailed to submit written comments to the local government. Written comments should describe the nature and extent of any cultural resources that exist in the project area and identify individuals with specific knowledge about them. The local government shall send a copy of all comments to the Gorge Commission.

Consultation and Ethnographic Research

1. When written comments are submitted to a local government in a timely manner, the project applicant shall offer to meet with the interested persons within 10 calendar days. The 10-day consultation period may be extended upon agreement between the project applicant and the interested persons.

   Consultation meetings should provide an opportunity for interested persons to explain how the proposed use may affect cultural resources. Recommendations to avoid potential conflicts should be discussed.

   All written comments and consultation meeting minutes shall be incorporated into the reconnaissance or historic survey report. In instances where a survey is not required, all such information shall be recorded and addressed in a report that typifies a survey report; inapplicable elements may be omitted.

2. A project applicant who is proposing a large-scale use shall conduct interviews and other forms of ethnographic research if interested persons submit a written request for such research. All requests must include a description of the cultural resources that may be affected by the proposed use and the identity of knowledgeable informants. Ethnographic research shall be conducted by qualified specialists. Tape recordings, maps, photographs, and minutes shall be used when appropriate.

   All written comments, consultation meeting minutes, and ethnographic research shall be incorporated into the reconnaissance or historic survey report. In instances where a survey is not required, all such information shall be recorded and addressed in a report that typifies a survey report.

Surveys and Survey Reports

Reconnaissance Surveys--Small-Scale Uses

1. Reconnaissance surveys for small-scale uses shall generally include a surface survey and subsurface testing. They shall meet the following guidelines:

   A. A surface survey of the project area shall be conducted, except for inundated areas and impenetrable thickets.

B. Subsurface testing shall be conducted if the surface survey reveals that cultural resources may be present. Subsurface probes shall be placed at intervals sufficient to determine the absence or presence of cultural resources.

Reconnaissance Survey Reports--Small-Scale Uses

1. The results of a reconnaissance survey for small-scale uses shall be documented in a confidential report that includes:

   A. A description of the fieldwork methodology used to identity cultural resources, including a description of the type and extent of the reconnaissance survey.

   B. A description of any cultural resources that were discovered in the project area, including a written description and photographs.

   C. A map that shows the project area, the areas surveyed, the location of subsurface probes, and, if applicable, the approximate boundaries of the affected cultural resources and a reasonable buffer zone.

Reconnaissance Surveys--Large-Scale Uses

1. Reconnaissance surveys for large-scale uses shall be designed by a qualified professional. A written description of the survey shall be submitted to and approved by the Gorge Commission's designated archaeologist.

2. Reconnaissance surveys shall reflect the physical characteristics of the project area and the design and potential effects of the proposed use. They shall meet the following guidelines:

   A. Archival research shall be performed before any field work. It should entail a thorough examination of tax records; historic maps, photographs, and drawings; previous archaeological, historic, and ethnographic research; cultural resource inventories and records maintained by federal, state, and local agencies; and primary historic accounts, such as diaries, journals, letters, and newspapers.

   B. Surface surveys shall include the entire project area, except for inundated areas and impenetrable thickets.

   C. Subsurface probes shall be placed at intervals sufficient to document the presence or absence of cultural resources.

   D. Archaeological site inventory forms shall be submitted to the SHPO whenever cultural resources are discovered.

Reconnaissance Survey Reports--Large-Scale Uses

1. The results of a reconnaissance survey for large-scale uses shall be documented in a confidential report that includes:

    A. A description of the proposed use, including drawings and maps.

    B. A description of the project area, including soils, vegetation, topography, drainage, past alterations, and existing land use.

    C. A list of the documents and records examined during the archival research and a description of any prehistoric or historic events associated with the project area.

    D. A description of the fieldwork methodology used to identify cultural resources, including a map that shows the project area, the areas surveyed, and the location of subsurface probes. The map shall be prepared at a scale of 1 inch equals 100 feet (1:1,200), or a scale providing greater detail.

    E. An inventory of the cultural resources that exist in the project area, including a written description, photographs, drawings, and a map. The map shall be prepared at a scale of 1 inch equals 100 feet (1:1,200), or a scale providing greater detail.

    F. A summary of all written comments submitted by Indian tribal governments and other interested persons.

    G. A preliminary assessment of whether the proposed use would or would not have an effect on cultural resources. The assessment shall incorporate concerns and recommendations voiced during consultation meetings and information obtained through archival and ethnographic research and field surveys.

Historic Surveys and Reports

1. Historic surveys shall document the location, form, style, integrity, and physical condition of historic buildings and structures. They shall include original photographs and maps. Archival research, blueprints, and drawings should be used as necessary.

2. Historic surveys shall describe any uses that will alter or destroy the exterior architectural appearance of the historic buildings or structures, or compromise features of the site that are important in defining the overall historic character of the historic buildings or structures.

3. The project applicant shall provide detailed architectural drawings and building plans that clearly illustrate all proposed alterations.

Notice of Survey Results

1. The local government shall submit a copy of all cultural resource survey reports to the SHPO and the Indian tribal governments. Survey reports may include measures to avoid affected cultural resources, such as a map that shows a reasonable buffer zone.

2. The SHPO and the tribes shall have 30 calendar days from the date a survey report is mailed to submit written comments to the local government. The local government shall record and address all written comments in its development review order.

Conclusion of the Cultural Resource Protection Process

1. The local government shall make a final decision on whether the proposed use would be consistent with the cultural resource goals, policies, and guidelines. If the final decision contradicts the comments submitted by the SHPO, the local government shall justify how it reached an opposing conclusion.

2. The cultural resource protection process may conclude when one of the following conditions exists:

   A. The proposed use does not require a reconnaissance or historic survey, no cultural resources are known to exist in the project area, and no substantiated concerns were voiced by interested persons within 20 calendar days of the date that a notice was mailed.

   B. A reconnaissance survey demonstrates that cultural resources do not exist in the project area and no substantiated concerns were voiced by interested persons within 20 calendar days of the date that a notice was mailed.

   C. The proposed use would avoid archaeological resources and traditional cultural resources that exist in the project area. To meet this guideline, a reasonable buffer zone must be established around the affected resources or properties; all ground-disturbing activities shall be prohibited within the buffer zone.

      Buffer zones must preserve the integrity and context of cultural resources. They will vary in width depending on the eventual use of the project area, the type of cultural resources that are present, and the characteristics for which the cultural resources may be significant. A deed covenant, easement, or other appropriate mechanism shall be developed to ensure that the buffer zone and the cultural resources are protected.

      An evaluation of significance shall be conducted if a project applicant decides not to avoid the affected cultural resource. In these instances, the

reconnaissance survey and survey report shall be incorporated into the evaluation of significance.

D. A historic survey demonstrates that the proposed use would not have an effect on historic buildings or structures because:

(1) The SHPO concludes that the historic buildings or structures are clearly not significant, as determined by using the criteria in the "National Register Criteria for Evaluation" (36 CFR 60.4), or

(2) The proposed use would not compromise the historic or architectural character of the affected buildings or structures, or compromise features of the site that are important in defining the overall historic character of the affected buildings or structures, as determined by the guidelines and standards in *The Secretary of the Interior's Standards for Rehabilitation* (U.S. Department of the Interior 1990) and *The Secretary of the Interior's Standards for Historic Preservation Projects* (U.S. Department of the Interior 1983).

The historic survey conducted by the Gorge Commission may provide sufficient information to satisfy these guidelines. If it does not, architectural and building plans, photographs, and archival research may be required. The project applicant shall be responsible for providing information beyond that included in the survey conducted by the Gorge Commission.

The historic survey and report must demonstrate that these guidelines have been clearly and absolutely satisfied. If the SHPO or the local government question whether these guidelines have been satisfied, the project applicant shall conduct an evaluation of significance.

Evaluation of Significance

Evaluation Criteria and Information Needs

1. If cultural resources would be affected by a new use, an evaluation of their significance shall be conducted. Evaluations of significance shall meet the following guidelines:

A. Evaluations of significance shall follow the procedures in *How to Apply the National Register Criteria for Evaluation* (U.S. Department of the Interior, no date) and *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King, no date). They shall be presented within local and regional contexts and shall be guided by previous research and current research designs that are relevant to specific research questions for the Columbia River Gorge.

B. To evaluate the significance of cultural resources, the information gathered during the reconnaissance or historic survey may have to be supplemented. Detailed field mapping, subsurface testing, photographic documentation, laboratory analyses, and archival research may be required.

C. The project applicant shall contact Indian tribal governments and interested persons, as appropriate. Ethnographic research shall be undertaken as necessary to fully evaluate the significance of the cultural resources.

D. The evaluation of significance shall follow the principles, guidelines, and report format recommended by the Oregon State Historic Preservation Office (Oregon SHPO 1990) or Washington Office of Archaeology and Historic Preservation (Washington SHPO, no date). It shall incorporate the results of the reconnaissance or historic survey and shall illustrate why each cultural resource is or is not significant. Findings shall be presented within the context of relevant local and regional research.

E. All documentation used to support the evaluation of significance shall be cited. Evidence of consultation with Indian tribal governments and other interested persons shall be presented. All comments, recommendations, and correspondence from Indian tribal governments and interested persons shall be appended to the evaluation of significance.

Notice of Evaluation Results

1. If the evaluation of significance demonstrates that the cultural resources are not significant, the local government shall submit a copy of the evaluation of significance to the SHPO and the Indian tribal governments.

2. The SHPO, Indian tribal governments, and interested persons shall have 30 calendar days from the date the evaluation of significance is mailed to submit written comments to the local government. The local government shall record and address all written comments in its development review order.

Cultural Resources are Culturally Significant

1. If an Indian tribal government believes that the affected cultural resources are culturally significant, contrary to the evaluation submitted by the project applicant, the Cultural Advisory Committee (CAC) shall make an independent review of the applicant's evaluation and the Indian tribal government's substantiated concerns. The CAC shall formulate a recommendation regarding the significance of the cultural resources.

2. The Indian tribal government shall substantiate its concerns in a written report. The report shall be submitted to the local government, CAC, and the project applicant within 15 calendar days from the date the evaluation of significance is

mailed. The CAC must submit its recommendation to the local government within 30 calendar days from the date the evaluation of significance is mailed.

Conclusion of the Cultural Resource Protection Process

1. The local government shall make a final decision on whether the affected resources are significant. If the final decision contradicts the comments or recommendations submitted by the SHPO or CAC, the local government shall justify how it reached an opposing conclusion.

2. The cultural resource protection process may conclude if the affected cultural resources are not significant.

3. If the project applicant or the local government determines that the cultural resources are significant, the effects of the proposed use shall be assessed.

Assessment of Effect

Assessment Criteria and Information Needs

1. If a use could potentially affect significant cultural resources, an assessment shall be made to determine if it would have no effect, no adverse effect, or an adverse effect. The assessment shall meet the following guidelines:

    A. The assessment of effect shall be based on the criteria published in "Protection of Historic Properties" (36 CFR 800.5) and shall incorporate the results of the reconnaissance or historic survey and the evaluation of significance. All documentation shall follow the requirements listed in 36 CFR 800.11.

        (1) Proposed uses are considered to have an effect on cultural resources when they alter or destroy characteristics of the resources that make them significant [36 CFR 800.5].

        (2) Proposed uses are considered to have an adverse effect when they may diminish the integrity of the cultural resource's location, design, setting, materials, workmanship, feeling, or association [36 CFR 800.5]. Adverse effects on cultural resources include, but are not limited to:

            (a) Physical destruction, damage, or alteration of all or part of the cultural resource.

            (b) Isolation of the cultural resource from its setting or alteration of the character of the resource's setting when that character contributes to the resource's qualification as being significant.

(c) Introduction of visual, audible, or atmospheric elements that are out of character with the cultural resource or its setting.

(d) Neglect of a significant cultural resource resulting in its deterioration or destruction, except as described in 36 CFR 800.5.

B. The assessment of effect shall be prepared in consultation with Indian tribal governments and interested persons, as appropriate. The concerns and recommendations voiced by Indian tribal governments and interested persons shall be recorded and addressed in the assessment.

C. The effects of a proposed use that would otherwise be determined to be adverse may be considered to be not adverse if any of the following instances apply:

(1) The cultural resources are of value only for their potential contribution to archeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research before development begins, and such research is conducted in accordance with applicable professional standards and guidelines.

(2) The undertaking is limited to the rehabilitation of buildings and structures, and is conducted in a manner that preserves the historical and architectural character of affected cultural resources through conformance with *The Secretary of the Interior's Standards for Rehabilitation* (U.S. Department of the Interior 1990) and *The Secretary of the Interior's Standards for Historic Preservation Projects* (U.S. Department of the Interior 1983).

(3) The proposed use is limited to the transfer, lease, or sale of cultural resources, and adequate restrictions or conditions are included to ensure preservation of the significant features of the resources.

Notice of Assessment Results

1. If the assessment of effect concludes that the proposed use would have no effect or no adverse effect on significant cultural resources, the local government shall submit a copy of the assessment to the SHPO and the Indian tribal governments.

2. The SHPO, Indian tribal governments, and interested persons shall have 30 calendar days from the date the assessment of effect is mailed to submit written comments to the local government. The local government shall record and address all written comments in its development review order.

Conclusion of the Cultural Resource Protection Process

1. The local government shall make a final decision on whether the proposed use would have no effect, no adverse effect, or an adverse effect. If the final decision contradicts the comments submitted by the SHPO, the local government shall justify how it reached an opposing conclusion.

2. The cultural resource protection process may conclude if the proposed use would have no effect or no adverse effect on significant cultural resources.

3. A mitigation plan shall be prepared if a project applicant or the local government determines that the proposed use would have an adverse effect on significant cultural resources.

Mitigation Plans

Mitigation Plan Criteria and Information Needs

1. Mitigation plans shall be prepared when proposed uses would have an adverse effect on significant cultural resources. The plans shall reduce an adverse effect to no effect or no adverse effect. Mitigation plans shall meet the following guidelines:

   A. Mitigation plans shall be prepared in consultation with persons who have concerns about or knowledge of the affected cultural resources, including Indian tribal governments, Native Americans, local governments whose jurisdiction encompasses the project area, and the SHPO.

   B. Avoidance of cultural resources through project design and modification is preferred. Avoidance may be affected by reducing the size, scope, configuration, and density of the proposed use.

      Alternative mitigation measures shall be used only if avoidance is not practicable. Alternative measures include, but are not limited to, burial under fill, stabilization, removal of the cultural resource to a safer place, and partial to full excavation and recordation. If the mitigation plan includes buffer zones to protect cultural resources, a deed covenant, easement, or other appropriate mechanism shall be developed and recorded in county deeds and records.

   C. Mitigation plans shall incorporate the results of the reconnaissance or historic survey, the evaluation of significance, and the assessment of effect, and shall provide the documentation required in 36 CFR 800.11, including, but not limited to:

      (1) A description and evaluation of any alternatives or mitigation measures that the project applicant proposes for reducing the effects of the proposed use.

(2) A description of any alternatives or mitigation measures that were considered but not chosen and the reasons for their rejection.

(3) Documentation of consultation with the SHPO regarding any alternatives or mitigation measures.

(4) A description of the project applicant's efforts to obtain and consider the views of Indian tribal governments, interested persons, and local governments.

(5) Copies of any written recommendations submitted to the local government or project applicant regarding the effects of the proposed use on cultural resources and alternatives to avoid or reduce those effects.

Notice of Mitigation Plan Results

1. If a mitigation plan reduces the effect of a use from an adverse effect to no effect or no adverse effect, the local government shall submit a copy of the mitigation plan to the SHPO and the Indian tribal governments.

2. The SHPO, Indian tribal governments, and interested persons shall have 30 calendar days from the date the mitigation plan is mailed to submit written comments to the local government. The local government shall record and address all written comments in its development review order.

Conclusion of the Cultural Resource Protection Process

1. The local government shall make a final decision on whether the mitigation plan would reduce an adverse effect to no effect or no adverse effect. If the final decision contradicts the comments submitted by the SHPO, the local government shall justify how it reached an opposing conclusion.

2. The cultural resource protection process may conclude if a mitigation plan would reduce an adverse effect to no effect or no adverse effect.

3. The proposed use shall be prohibited when acceptable mitigation measures fail to reduce an adverse effect to no effect or no adverse effect.

Cultural Resources Discovered After Construction Begins

1. The following procedures shall be affected when cultural resources are discovered during construction activities. All survey and evaluation reports and mitigation plans shall be submitted to the local government and the SHPO. Indian tribal governments also shall receive a copy of all reports and plans if the cultural resources are prehistoric or otherwise associated with Native Americans.

A. Halt of Construction. All construction activities within 100 feet of the discovered cultural resource shall cease. The cultural resources shall remain as found; further disturbance is prohibited.

B. Notification. The project applicant shall notify the local government and the Gorge Commission within 24 hours of the discovery. If the cultural resources are prehistoric or otherwise associated with Native Americans, the project applicant shall also notify the Indian tribal governments within 24 hours.

C. Survey and Evaluation. The Gorge Commission shall survey the cultural resources after obtaining written permission from the landowner and appropriate permits from the SHPO. (See Oregon Revised Statute ORS 358.905 to 358.955, and Revised Code of Washington [RCW] 27.53). It shall gather enough information to evaluate the significance of the cultural resources. The survey and evaluation shall be documented in a report that generally follows the guidelines in the "Reconnaissance Survey Reports--Large-Scale Uses" and "Evaluation of Significance: Evaluation Criteria and Information Needs" sections of this chapter.

   Based on the survey and evaluation report and any written comments, the local government shall make a final decision on whether the resources are significant. Construction activities may recommence if the cultural resources are not significant.

   A mitigation plan shall be prepared if the affected cultural resources are significant.

D. Mitigation Plan. Mitigation plans shall be prepared according to the information, consultation, and report guidelines contained in the "Mitigation Plans: Mitigation Plan Criteria and Information Needs" section of this chapter. Construction activities may recommence when the conditions in the mitigation plan have been executed.

Discovery of Human Remains

1. The following procedures shall be affected when human remains are discovered during a cultural resource survey or during construction. Human remains means articulated or disarticulated human skeletal remains, bones, or teeth, with or without attendant burial artifacts.

   A. Halt of Activities. All survey, excavation, and construction activities shall cease. The human remains shall not be disturbed any further.

   B. Notification. Local law enforcement officials, the local government, the Gorge Commission, and the Indian tribal governments shall be contacted immediately.

C. Inspection. The county coroner, or appropriate official, shall inspect the remains at the project site and determine if they are prehistoric/historic or modern. Representatives from the Indian tribal governments shall have an opportunity to monitor the inspection.

D. Jurisdiction. If the remains are modern, the appropriate law enforcement officials shall assume jurisdiction and the cultural resource protection process may conclude.

E. Treatment. In Oregon, prehistoric/historic remains of Native Americans shall generally be treated in accordance with the procedures set forth in ORS 97.740 to 97.760. In Washington, the procedures set forth in RCW 27.44 and 68.05 shall generally be implemented if the remains are prehistoric/historic.

If the human remains will be reinterred or preserved in their original position, a mitigation plan shall be prepared in accordance with the consultation and report requirements specified in the "Mitigation Plans: Mitigation Plan Criteria and Information Needs" section of this chapter.

The mitigation plan shall accommodate the cultural and religious concerns of Native Americans. The cultural resource protection process may conclude when the conditions set forth in the "Mitigation Plans: Conclusion of the Cultural Resource Protection Process" section of this chapter are met and the mitigation plan is executed.

Cultural Advisory Committee

1. The Gorge Commission shall establish a Cultural Advisory Committee (CAC) within 200 days after the Secretary of Agriculture concurs with the Management Plan. The CAC shall comprise cultural resource professionals, interested individuals, and at least one representative from each of the four Indian tribes.

   The CAC will perform six principal functions:

   A. Monitor cultural resource surveys, evaluations, impact assessments, and mitigation plans.

   B. Periodically formulate and submit recommendations to SHPOs, local governments, and the Gorge Commission regarding cultural resource surveys, evaluations, impact assessments, and mitigation plans.

   C. Monitor cultural resource decisions made by SHPOs and local governments.

   D. Recommend procedural and administrative changes to the Gorge Commission that would improve the cultural resource protection process.

E. Advise the Gorge Commission on the design and implementation of future cultural resource inventories, including oral history programs and survey strategies.

F. Review evaluations of significance when a disagreement arises between a project applicant and an Indian tribal government. In these instances, the CAC shall submit written recommendations to the local government. Recommendations shall be based on the evaluation prepared by the project applicant, reports submitted by Indian tribal governments, and comments submitted by interested persons, including the SHPO.

SMA PROVISIONS

SMA Goal

Protect and enhance cultural resources.

SMA Policies

1. New developments or land uses shall not adversely affect significant cultural resources.

2. Federal agencies shall follow steps 1 through 5 under Guideline 4 below, for new developments or land uses on all federal lands, federally assisted projects, and forest practices.

3. Reviewing agencies shall use the procedures defined by the Gorge Commission for the GMA for proposed developments or land uses not listed in Policy 2, above.

4. Well-defined concentrations of significant cultural resources shall be designated as Open Space.

5. All cultural resource information shall remain confidential, according to Section 6(a)(1)(A) of the Scenic Area Act. Federal agency cultural resource information is also exempt by statute from the Freedom of Information Act under 16 USC (United States Code) 470 aa and 36 CFR 296.18.

6. Principal investigators shall meet the professional standards published in 36 CFR 61.

7. The Forest Service shall be responsible for performing steps 1 through 5 under Guideline 4 for forest practices and National Forest system lands.

8. The Forest Service shall consult with the Indian tribal governments and other consulting parties in performing steps 1 through 5 under Guideline 4.

9. The Forest Service shall consult with Indian tribal governments and other consulting parties for opportunities to enhance cultural resources.

SMA Guidelines

1. All cultural resource surveys, evaluations, assessments, and mitigation plans shall be performed by professionals whose expertise reflects the type of cultural resources that are involved. Principal investigators shall meet the professional standards published in 36 CFR 61.

2. For federal or federally assisted undertakings, the reviewing agency shall complete its consultation responsibilities under Section 106 of the Historic Preservation Act of 1966 [36 CFR 800.2].

3. Discovery during construction: All authorizations for new developments or land uses shall require the immediate notification of the reviewing agency if cultural resources are discovered during construction or development. If cultural resources are discovered, particularly human bone or burials, work in the immediate area of discovery shall be suspended until a cultural resource professional can evaluate the potential significance of the discovery and recommend measures to protect and/or recover the resource.

   If the discovered material is suspected to be human bone or a burial, the following procedures shall be used:

   A. The applicant shall stop all work in the vicinity of the discovery.

   B. The applicant shall immediately notify the Forest Service, the applicant's cultural resource professional, the county coroner, and appropriate law enforcement agencies.

   C. The Forest Service shall notify the tribal governments if the discovery is determined to be an Indian burial or a cultural resource.

4. Reviewing agencies shall use the following steps under 36 CFR 800.4 for assessing potential effects to cultural resources and 36 CFR 800.5 for assessing adverse effects to cultural resources.

   Step 1: Literature Review and Consultation

   A. An assessment shall be undertaken to determine whether any cultural resources listed on the National Register of Historic Places at the national, state, or local level are present on or within the area of potential direct and indirect impacts.

   B. A search shall be made of state and county government, National Scenic Area/Forest Service, and any other pertinent inventories, such as archives and photographs, to identify cultural resources. The search shall include consultation with the State Historic Preservation Office (SHPO) and tribal governments. State and tribal government response to the consultation request shall be allowed for 30 days.

   C. Cultural resource professionals knowledgeable about the area shall be consulted.

Step 2: Field Inventory

A. As determined by step 1, the presence of a recorded or known cultural resource, including those reported by tribal governments to be on or within the immediate vicinity of a new development or land use, shall require a field inventory by a cultural resource professional.

B. Tribal representatives shall be invited to participate in the field inventory.

C. The field inventory shall conform to one of the following standards, as determined by the cultural resource professional:

(1) Complete survey: The systematic examination of the ground surface through a controlled procedure, such as walking an area in evenly spaced transects. A complete survey may also require techniques such as clearing of vegetation or augering or shovel probing of subsurface soils for the presence of buried cultural resources.

(2) Sample survey: The sampling of an area to assess the potential of cultural resources within the area of proposed development or use. This technique is generally used for parcels that are large or difficult to survey, and is generally accomplished by a stratified random or non-stratified random sampling strategy. A parcel is stratified either by variables such as vegetation, topography or elevation, or by non-environmental factors such as a survey grid.

Under this method, statistically valid samples are selected and surveyed to indicate the probability of presence, numbers, and types of cultural resources throughout the sampling strata. Depending on the results of the sample, a complete survey may or may not subsequently be recommended.

D. A field inventory report shall be required and shall include the following:

(1) A narrative integrating the literature review (step 1) with the field inventory (step 2).

(2) A description of the field inventory methodology used. The description shall include the type and extent of field inventory and shall be supplemented by maps that graphically illustrate the areas surveyed and not surveyed and provide the rationale for each.

(3) A statement of the presence or absence of cultural resources within the area of the new development or land use.

(4) When cultural resources are not located, a statement of the likelihood of buried or otherwise concealed cultural resources. Recommendations and standards for monitoring, if appropriate, shall be included.

E. The report shall follow the format specified by the Washington Office of Archaeology and Historic Preservation for inventories conducted in the State of Washington. Reports for inventories conducted in the State of Oregon shall follow the format specified by the Oregon State Historic Preservation Office.

F. The field inventory report shall be presented to the Forest Service for review.

Step 3: Evaluations of Significance

A. When cultural resources are found within the area of the new development or land use, an evaluation of significance shall be completed for each cultural resource in accordance with the criteria of the National Register of Historic Places (36 CFR 60.4).

B. Evaluations of cultural resource significance shall be guided by previous and current research designs relevant to specific research questions for the area.

C. Evaluations of the significance of traditional cultural properties shall follow National Register Bulletin 38, "Guidelines for the Evaluation and Documentation of Traditional Cultural Properties," within local and regional contexts.

D. Recommendations for eligibility to the National Register shall be completed for each identified resource, in accordance with National Register criteria A through D (36 CFR 60.4). The Forest Service shall review evaluations for adequacy.

E. Evidence of consultation with tribal governments and individuals with knowledge of the cultural resources in the project area, and documentation of their concerns, shall be included as part of the evaluation of significance.

Step 4: Assessment of Effect

A. For each significant (i.e., eligible for the National Register) cultural resource inventoried within the area of the proposed development or change in use, assessments of effect shall be completed, using the criteria outlined in 36 CFR 800.5 ("Assessing Effects"). Evidence of consultation with tribal governments and individuals with knowledge of the cultural resources of the project area shall be included for B through D below. The Forest Service shall review each determination for adequacy.

B. If the proposed development or change in use will have "No Adverse Effect" (36 CFR 800.4) to a significant cultural resource, documentation for that finding shall be completed, following the "Documentation Standards" of 36 CFR 800.11. If the proposed development or change in use will have an effect then the criteria of adverse effect must be applied (36 CFR 800.5).

C. If the proposed development or change in use will have an "Adverse Effect" [36 CFR 800.5] to a significant cultural resource, the type and extent of "adverse effect" upon the qualities of the property that make it eligible for the National Register shall be documented (36 CFR 800.6 “Resolution of Adverse Effects”). This documentation shall follow the process outlined under 36 CFR 800.11 (“Failure to Resolve Adverse Effects”).

D. If the "effect" appears to be beneficial (i.e., an enhancement to cultural resources), recommendations shall be documented concerning the beneficial effects upon the qualities of the cultural resource that make it eligible for the National Register. This documentation shall follow the process outlined under 36 CFR 800.11 ("Documentation Standards").

Step 5: Mitigation

A. If there will be an effect on cultural resources, mitigation measures shall be provided (36 CFR 800.6 “Resolution of Adverse Effects”). Mitigation measures that shall be considered include avoidance of the property through project design or modification and subsequent protection, burial under fill, data recovery excavations, and other appropriate measures.

B. Evidence of consultation with tribal governments and individuals with knowledge of the affected resources, and documentation of their concerns, shall be included for all mitigation proposals.

C. The Forest Service shall review all mitigation proposals for adequacy.

5. Determination of potential effects to significant cultural resources shall include consideration of cumulative effects of proposed developments that are subject to any of the following: 1) a reconnaissance or historic survey; 2) a determination of significance; 3) an assessment of effect; or 4) a mitigation plan. *(Added: U.S. Sec. Ag. concurrence 7/1/11)*

CHAPTER

3

Natural Resources

Climate, geology, soils, and other environmental factors combine to make the Gorge rich in natural resources. For this chapter, natural resources mean wetlands, streams, ponds and lakes, riparian areas, wildlife and wildlife habitat, rare plants, and natural areas.

The diverse climate of the Gorge fosters nearly 1,000 native species of wildflowers, including many species that are listed as endangered, threatened, or sensitive. Sixteen species do not occur outside the Gorge region (endemic).

In addition to rare plants, many significant plant communities, or natural areas, occur in the Gorge. Forty-five natural areas were identified: 24 in Oregon and 21 in Washington. Table 4 describes the size and characteristics of each natural area. They range from old growth forests in Multnomah Basin in Multnomah County to bunchgrass prairies in the Columbia Hills of Klickitat County.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act directs the Gorge Commission and the Forest Service to inventory, protect, and enhance natural resources. New residential and commercial development, mineral operations, and other development may not adversely affect natural resources [Section 6(d)(3)].

The Scenic Area Act also requires the Management Plan to protect and enhance open spaces [Section 6(d)(3)]. Open spaces include "fish and wildlife habitat; lands which support plant species that are endemic to the scenic area or which are listed as rare, threatened, or endangered species pursuant to State or Federal Endangered Species Acts; ecologically and scientifically significant natural areas; . . . water areas and wetlands . . ." [Section 2(l)].

KEY ISSUES

Many natural resources can be destroyed by development or overuse. Grading a building site may fill a wetland, add sediment to nearby streams or lakes, or uproot rare plants. Siting new structures too close to wildlife sites can cause sensitive species to abandon nests and feeding areas. Improperly designed fences hinder deer and elk movement.

Existing federal, state, and local laws provide uneven protection to natural resources. Rare plants, natural areas, and many sensitive wildlife species on private land are simply not protected. At least eight federal and state laws affect activities in wetlands. However, most of

these laws do not focus on the protection of wetlands as their primary purpose. Consequently, many activities that destroy wetlands are not currently regulated. Little or no protection is afforded to associated riparian areas.

Many natural resources are inadvertently harmed. Landowners and developers may be unaware that sensitive natural resources exist within a project area. Rare plants, wildlife sites, and other natural resources are often difficult for the layperson to identify.

Careful planning can often protect natural resources, while allowing reasonable development. However, many local planning departments lack adequate inventories and protection standards to identify potential conflicts between development and natural resources. Expertise is also an issue.

Mitigating the effects of development on natural resources may require assistance from qualified professionals, such as wildlife biologists and botanists.

OVERVIEW OF NATURAL RESOURCES PROVISIONS

The natural resource objectives, policies, and guidelines for the GMA are divided into five sections: wetlands; streams, ponds, lakes, and riparian areas; wildlife habitat; rare plants; and natural areas. They regulate most uses, except low-intensity activities and forest practices.

The SMA provisions regulate most activities, including forest practices. Goals and policies for water resources are followed by those for wildlife and plants. Guidelines for water resources and for wildlife and plants complete the SMA natural resources provisions.

A variety of tools is used to protect natural resources in the GMA and SMA. The guidelines require leaving a natural buffer zone around wetlands, streams, ponds, lakes, and riparian areas. In the GMA, exceptions are made for several uses, including low-intensity activities and water-related and water-dependent uses, if adequate protection of the resource is provided.

Site-specific management plans are required for development proposed near sensitive wildlife sites. If habitat would be altered by new development, resource rehabilitation and enhancement are required.

The guidelines protect sensitive plant species by ensuring that new development and uses avoid plant sites and their adjacent habitat. A buffer would generally be created around plant sites. Within this buffer, low-intensity uses are generally allowed outright. Other development is prohibited in the buffer area. Exceptions may be made in the GMA if the buffer would deny all reasonable use of a parcel.

Most natural areas are designated Open Space; guidelines for this designation are found in Part II, Chapter 3: Open Space. In the GMA, several natural areas are designated Agriculture-Special. In this designation, existing livestock grazing is allowed, new grazing must be reviewed, and cultivation is prohibited to protect plant communities. Guidelines for the Agriculture-Special designation are found in Part II, Chapter 1: Agricultural Land.

GMA PROVISIONS

Determination of potential natural resources effects shall include consideration of cumulative effects of proposed developments within the following areas: 1) wetlands and their buffer zones; 2) streams, ponds, lakes, riparian areas and their buffer zones; 3) sites within 1,000 feet of sensitive wildlife areas and sites; and 4) sites within 1,000 feet of rare plants. *(Added: CRGC adoption 7/13/10; U.S. Sec. Ag. concurrence 11/1/10)*

WETLANDS

GMA Goals

1. Achieve no overall net loss of wetlands acreage and functions.

2. Increase the quantity and quality of wetlands.

GMA Objective

Promote public programs that offer incentives to landowners who protect and enhance wetlands. The Gorge Commission shall notify landowners whose property has been designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land or Large or Small Woodland and contains wetlands. It shall inform landowners about the values of wetlands and the rationale for regulating new uses in wetlands and wetlands buffer zones, including cultivation.

GMA Policies

1. The wetlands goals, policies, and guidelines in the Management Plan shall not apply to the main stem of the Columbia River. The Gorge Commission will rely on the applicable federal and state laws to protect wetlands in the Columbia River, including the U.S. Clean Water Act, Washington State Environmental Policy Act, Washington Hydraulic Code, and Oregon Removal-Fill Act.

   The main stem of the Columbia River is depicted on the map titled "Boundary Map, Columbia River Gorge National Scenic Area," numbered NSA-001, and dated September 1986. (This map is available at county planning departments and Commission and Forest Service offices.) The boundaries of the main stem appear as a heavy black line that generally follows the shoreline. For the Management Plan, backwaters and isolated water bodies created by roads and railroads are not part of the main stem of the Columbia River.

2. All wetlands, regardless of their size or functions, warrant protection from new uses that may alter or destroy wetlands functions.

3. The National Wetlands Inventory (U.S. Department of the Interior 1987) and the list of hydric soils shall be used as a general guide to the location of wetlands; additional wetlands are assumed to exist and shall be protected.

4. The exact location of wetlands boundaries shall be delineated using the procedures specified in *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1, on-line edition, updated through March 21, 1997).

5. An undisturbed buffer should be preserved around wetlands to protect and enhance wetlands functions and associated uplands.

6. Low-intensity uses may be allowed in wetlands and wetlands buffer zones without review. Uses that may impact wetlands acreage and functions may be allowed in wetlands or wetlands buffer zones, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and the approval criteria in this section.

7. New uses that are not water-dependent or water-related shall be allowed in wetlands when less environmentally damaging practicable alternatives do not exist.

8. Impacts to wetlands shall be allowed only when all practicable measures have been applied to minimize those impacts that are unavoidable and in the public interest.

9. A project applicant shall be required to offset unavoidable impacts to wetlands that result from his/her actions by restoring, creating, or enhancing wetlands and by providing appropriate wetlands buffer zones as specified in the Management Plan.

10. Project proposals affecting wetlands shall be coordinated with federal and state agencies that regulate new uses in wetlands.

11. Within 6 months of the date that the State of Oregon or Washington adopts a comprehensive wetlands ordinance, the Gorge Commission shall complete an evaluation that compares the state ordinance to the wetlands policies and guidelines in the Management Plan.

    If the Gorge Commission determines that the state ordinance provides equal or greater protection to wetlands than the policies and guidelines in the Management Plan, local governments may adopt the state ordinance in lieu of the wetlands policies and guidelines in the Management Plan.

12. Enhancement of wetlands not associated with any other project proposal may be allowed, if such efforts comply with the wetlands provisions in the Management Plan. Enhancement efforts shall be conducted pursuant to a wetlands compensation plan, as described in this section.

All enhancement plans must be approved by the local government, after consultation with federal and state agencies with jurisdiction over wetlands.

GMA Guidelines

Review Uses

1. The following uses may be allowed in wetlands and wetland buffer zones, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and "Approval Criteria for Modifications to Serviceable Structures and Minor Water-Dependent and Water-Related Structures in Wetlands" in this section.

   A. The modification, expansion, replacement, or reconstruction of serviceable structures, if such actions would not (1) increase the size of an existing structure by more than 100 percent, (2) result in a loss of wetlands acreage or functions, and (3) intrude further into a wetland or wetlands buffer zone.

      New structures shall be considered intruding further into a wetland or wetlands buffer zone if any portion of the structure is located closer to the wetland or wetlands buffer zone than the existing structure.

   B. The construction of minor water-related recreation structures that are available for public use. Structures in this category shall be limited to boardwalks; trails and paths, provided their surface is not constructed of impervious materials; observation decks; and interpretative aids, such as kiosks and signs.

   C. The construction of minor water-dependent structures that are placed on pilings, if the pilings allow unobstructed flow of water and are not placed so close together that they effectively convert an aquatic area to dry land. Structures in this category shall be limited to public and private docks and boat houses, and fish and wildlife management structures that are constructed by federal, state, or tribal resource agencies.

2. Except uses allowed outright and review uses in Guidelines 1A through 1C, above, proposed uses may be allowed in wetlands and wetlands buffer zones subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and "Approval Criteria for Other Review Uses in Wetlands" in this section.

Site Plans for Review Uses in Wetlands

1. In addition to the information required in all site plans, site plans for proposed uses in wetlands or wetlands buffer zones shall include: a site plan map prepared at a scale of 1 inch equals 100 feet (1:1,200), or a scale providing greater detail; the

exact boundary of the wetland and the wetlands buffer zone; and a description of actions that would alter or destroy the wetland.

Approval Criteria for Modifications to Serviceable Structures and Minor Water-Dependent and Water-Related Structures in Wetlands

1. The uses identified in Guideline 1 under "Review Uses," above, may be allowed only if they meet all of the following criteria:

    A. Practicable alternatives for locating the structure outside of the wetland or wetland buffer zone and/or minimizing the impacts of the structure do not exist.

    B. All reasonable measures have been applied to ensure that the structure will result in the minimum feasible alteration or destruction of the wetland's functions, existing contour, vegetation, fish and wildlife resources, and hydrology.

    C. The structure will be constructed using best management practices.

    D. Areas disturbed during construction of the structure will be rehabilitated to the maximum extent practicable.

    E. The structure complies with all applicable federal, state, and local laws.

Approval Criteria for Other Review Uses in Wetlands

1. The uses identified in Guideline 2 under "Review Uses," above, may be allowed only if they meet all of the following criteria:

    A. The proposed use is water-dependent, or is not water-dependent but has no practicable alternative as determined by the practicable alternative test in this section.

    B. The proposed use is in the public interest as determined by the public interest test in this section.

    C. Measures will be applied to ensure that the proposed use results in the minimum feasible alteration or destruction of the wetland's functions, existing contour, vegetation, fish and wildlife resources, and hydrology.

    D. Groundwater and surface-water quality will not be degraded by the proposed use.

    E. Those portions of a proposed use that are not water-dependent or that have a practicable alternative will not be located in wetlands or wetlands buffer zones.

    F. The proposed use complies with all applicable federal, state, and local laws.

G. Areas that are disturbed during construction of the proposed use will be rehabilitated to the maximum extent practicable.

H. Unavoidable impacts to wetlands will be offset through the deliberate restoration, creation, or enhancement of wetlands. Wetlands restoration, creation, and enhancement are not alternatives to the guidelines listed above; they shall be used only as a last resort to offset unavoidable wetlands impacts.

The following wetlands restoration, creation, and enhancement guidelines shall apply:

(1) Impacts to wetlands shall be offset by restoring or creating new wetlands or by enhancing degraded wetlands. Wetlands restoration shall be the preferred alternative.

(2) Wetlands restoration, creation, and enhancement projects shall be conducted in accordance with a wetlands compensation plan.

(3) Wetlands restoration, creation, and enhancement projects shall use native vegetation.

(4) The size of replacement wetlands shall equal or exceed the following ratios. The first number specifies the required acreage of replacement wetlands, and the second number specifies the acreage of wetlands altered or destroyed.

Restoration: 2:1

Creation: 3:1

Enhancement: 4:1

(5) Replacement wetlands shall replicate the functions of the wetlands that will be altered or destroyed such that no net loss of wetlands functions occurs.

(6) Replacement wetlands should replicate the type of wetland that will be altered or destroyed. If this standard is not feasible or practical because of technical constraints, a wetland type of equal or greater benefit may be substituted, provided that no net loss of wetlands functions occurs.

(7) Wetlands restoration, creation, or enhancement should occur within 1,000 feet of the affected wetland. If this guideline is not practicable because of physical or technical constraints, replacement shall occur within the same watershed and as close to the altered or destroyed wetland as practicable.

(8) Wetlands restoration, creation, and enhancement efforts should be completed before a wetland is altered or destroyed. If it is not practicable to complete all restoration, creation, and enhancement efforts before the wetland is altered or destroyed, these efforts shall be completed before the new use is occupied or used.

(9) Five years after a wetland is restored, created, or enhanced, at least 75 percent of the replacement vegetation must survive. The project applicant shall monitor the hydrology and vegetation of the replacement wetland and shall take corrective measures to ensure that it conforms with the approved wetlands compensation plan and this guideline.

Wetlands Buffer Zones

1. The width of wetlands buffer zones shall be based on the dominant vegetation community that exists in a buffer zone.

2. The dominant vegetation community in a buffer zone is the vegetation community that covers the most surface area of that portion of the buffer zone that lies between the proposed activity and the affected wetland. Vegetation communities are classified as forest, shrub, or herbaceous.

   A. A forest vegetation community is characterized by trees with an average height equal to or greater than 20 feet, accompanied by a shrub layer; trees must form a canopy cover of at least 40 percent and shrubs must form a canopy cover of at least 40 percent. A forest community without a shrub component that forms a canopy cover of at least 40 percent shall be considered a shrub vegetation community for purposes of the Management Plan.

   B. A shrub vegetation community is characterized by shrubs and trees that are greater than 3 feet tall and form a canopy cover of at least 40 percent.

   C. A herbaceous vegetation community is characterized by the presence of herbs, including grass and grasslike plants, forbs, ferns, and non-woody vines.

3. Buffer zones shall be measured outward from a wetlands boundary on a horizontal scale that is perpendicular to the wetlands boundary. The following buffer zone widths shall be required:

Forest communities:	75 feet
Shrub communities:	100 feet
Herbaceous communities:	150 feet

4. Except as otherwise allowed, wetlands buffer zones shall be retained in their natural condition. When a buffer zone is disturbed by a new use, it shall be replanted with native plant species.

Rules for Delineating Wetlands Boundaries

1. The approximate location and extent of wetlands in the Scenic Area is shown on the National Wetlands Inventory (U.S. Department of the Interior 1987). In addition, the list of hydric soils and the soil survey maps shall be used as an indicator of wetlands.

   Some wetlands may not be shown on the wetlands inventory or soil survey maps. Wetlands that are discovered by the local planning staff during an inspection of a potential project site shall be delineated and protected.

2. The project applicant shall be responsible for determining the exact location of a wetlands boundary. Wetlands boundaries shall be delineated using the procedures specified in the *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1, on-line edition, updated through March 21, 1997.)

   All wetlands delineations shall be conducted by a professional who has been trained to use the federal delineation procedures, such as a soil scientist, botanist, or wetlands ecologist.

3. The local government may verify the accuracy of, and render adjustments to, a wetlands boundary delineation. If the adjusted boundary delineation is contested by the project applicant, the local government shall obtain professional services to render a final delineation, at the applicant's expense.

Practicable Alternative Test

1. An alternative site for a proposed use shall be considered practicable if it is available and the proposed use can be undertaken on that site after taking into consideration cost, technology, logistics, and overall project purposes.

   A practicable alternative does not exist if a project applicant satisfactorily demonstrates all of the following:

   A. The basic purpose of the use cannot be reasonably accomplished using one or more other sites in the vicinity that would avoid or result in less adverse effects on wetlands.

   B. The basic purpose of the use cannot be reasonably accomplished by reducing its proposed size, scope, configuration, or density, or by changing

the design of the use in a way that would avoid or result in less adverse effects on wetlands.

C. Reasonable attempts were made to remove or accommodate constraints that caused a project applicant to reject alternatives to the proposed use. Such constraints include inadequate infrastructure, parcel size, and land use designations. If a land use designation or recreation intensity class is a constraint, an applicant must request a Management Plan amendment to demonstrate that practicable alternatives do not exist.

Public Interest Test

1. The following factors shall be considered when determining if a proposed use is in the public interest:

   A. The extent of public need for the proposed use.

   B. The extent and permanence of beneficial or detrimental effects that the proposed use may have on the public and private uses for which the property is suited.

   C. The functions and size of the wetland that may be affected.

   D. The economic value of the proposed use to the general area.

   E. The ecological value of the wetland and probable effect on public health and safety, fish, plants, and wildlife.

Wetlands Compensation Plans

1. Wetlands compensation plans shall be prepared when a project applicant is required to restore, create, or enhance wetlands. They shall satisfy the following guidelines:

   A. Wetlands compensation plans shall be prepared by a qualified professional hired by the project applicant. They shall provide for land acquisition, construction, maintenance, and monitoring of replacement wetlands.

   B. Wetlands compensation plans shall include an ecological assessment of the wetland that will be altered or destroyed and the wetland that will be restored, created, or enhanced. The assessment shall include information on flora, fauna, hydrology, and wetlands functions.

   C. Compensation plans shall also assess the suitability of the proposed site for establishing a replacement wetland, including a description of the water source and drainage patterns, topography, wildlife habitat opportunities, and value of the existing area to be converted.

D. Compensation plans shall provide plan view and cross-sectional, scaled drawings; topographic survey data, including elevations at contour intervals no greater than 1 foot, slope percentages, and final grade elevations; and other technical information in sufficient detail to explain and illustrate:

(1) Soil and substrata conditions, grading, and erosion and sediment control needed for wetland construction and long-term survival.

(2) Planting plans that specify native plant species, quantities, size, spacing, or density; source of plant materials or seeds; timing, season, water, and nutrient requirements for planting; and where appropriate, measures to protect plants from predation.

(3) Water quality parameters, water source, water depths, water control structures, and water level maintenance practices needed to achieve the necessary hydrologic conditions.

E. A 5-year monitoring, maintenance, and replacement program shall be included in all plans. At a minimum, a project applicant shall provide an annual report that documents milestones, successes, problems, and contingency actions. Photographic monitoring stations shall be established and photographs shall be used to monitor the replacement wetland.

F. A project applicant shall demonstrate sufficient fiscal, technical, and administrative competence to successfully execute a wetlands compensation plan.

STREAMS, PONDS, LAKES, AND RIPARIAN AREAS

GMA Goals

1. Protect water quality, natural drainage, and fish and wildlife habitat of streams, ponds, lakes, and riparian areas.

2. Enhance aquatic and riparian areas.

GMA Objective

Through the Gorge Commission and local governments, encourage the use of existing public programs and incentives to rehabilitate and enhance streams, ponds, lakes, and riparian areas that have been disturbed.

GMA Policies

1. The stream, pond, lake, and riparian area goals, policies, and guidelines in the Management Plan shall not apply to those portions of the main stem of the Columbia River that adjoin the Urban Areas. The Gorge Commission will rely on the applicable federal and state laws to protect those portions of the Columbia River that adjoin the Urban Areas.

2. Proposed uses adjacent to streams, ponds, and lakes should preserve an undisturbed buffer zone that is wide enough to protect aquatic and riparian areas.

3. Low-intensity uses may be allowed outright in streams, ponds, lakes, and their buffer zones. Uses that may affect water quality, natural drainage, or wildlife habitat may be allowed in streams, ponds, lakes, and their buffer zones, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and the approval criteria in this section.

4. New uses that are not water-dependent or water-related shall be allowed in streams, ponds, lakes, and riparian areas if they are in the public interest and less environmentally damaging practicable alternatives do not exist.

5. Practicable measures shall be applied to minimize unavoidable impacts to aquatic and riparian areas.

6. A project applicant shall offset unavoidable impacts to aquatic areas and their buffer zones that result from his/her actions by rehabilitating or enhancing aquatic and riparian areas.

7. When uses are authorized in degraded aquatic and riparian areas, rehabilitation shall return the project area to its natural condition to the maximum extent practicable.

8. Enhancement of streams, ponds, lakes, and riparian areas not associated with any other development proposal may be allowed, if such efforts comply with the streams, ponds, lakes, and riparian area provisions in this Management Plan. Enhancement efforts shall be conducted pursuant to a rehabilitation and enhancement plan, as described in this section.

   All enhancement plans shall be approved by the local government, after consultation with federal and state agencies with jurisdiction over streams, ponds, lakes, and riparian areas.

GMA Guidelines

Review Uses

1. The following uses may be allowed in streams, ponds, lakes, and riparian areas, subject to compliance with guidelines for the protection of scenic, natural, cultural and recreation resources and "Approval Criteria for Modifications to Serviceable Structures and Minor Water-Dependent and Water-Related Structures in Aquatic and Riparian Areas" in this section.

    A. The modification, expansion, replacement, or reconstruction of serviceable structures, provided that such actions would not (1) increase the size of an existing structure by more than 100 percent, (2) result in a loss of water quality, natural drainage, and fish and wildlife habitat, or (3) intrude further into a stream, pond, lake, or buffer zone. New structures shall be considered intruding further into a stream, pond, lake, or buffer zone if any portion of the structure is located closer to the stream, pond, lake, or buffer zone than the existing structure.

    B. The construction of minor water-related recreation structures that are available for public use. Structures in this category shall be limited to boardwalks; trails and paths, provided their surface is not constructed of impervious materials; observation decks; and interpretative aids, such as kiosks and signs.

    C. The construction of minor water-dependent structures that are placed on pilings, if the pilings allow unobstructed flow of water and are not placed so close together that they effectively convert an aquatic area to dry land. Structures in this category shall be limited to public and private docks and boat houses, and fish and wildlife management structures that are constructed by federal, state, or tribal resource agencies.

2. Except uses allowed outright and review uses in Guidelines 1.A through 1.C, above, proposed uses may be allowed in streams, ponds, lakes, and riparian areas, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and "Approval Criteria for Other Review Uses in Aquatic and Riparian Areas" in this section.

Site Plans for Review Uses in Aquatic and Riparian Areas

1. In addition to the information required in all site plans, site plans for proposed uses in streams, ponds, lakes, and their buffer zones shall include: a site plan map prepared at a scale of 1 inch equals 100 feet (1:1,200), or a scale providing greater detail; the exact boundary of the ordinary high watermark or normal pool elevation and the prescribed buffer zone; and a description of actions that would alter or destroy the stream, pond, lake, or riparian area.

Approval Criteria for Modifications to Serviceable Structures and Minor Water-Dependent and Water-Related Structures in Aquatic and Riparian Areas

1. The uses identified in Guideline 1 under "Review Uses," above, may be allowed only if they meet all of the following criteria:

    A. Practicable alternatives for locating the structure outside of the stream, pond, lake, or buffer zone and/or minimizing the impacts of the structure do not exist.

    B. All reasonable measures have been applied to ensure that the structure will result in the minimum feasible alteration or destruction of water quality, natural drainage, and fish and wildlife habitat of streams, ponds, lakes, and riparian areas.

    C. The structure will be constructed using best management practices.

    D. Areas disturbed during construction of the structure will be rehabilitated to the maximum extent practicable.

    E. The structure complies with all applicable federal, state, and local laws.

Approval Criteria for Other Review Uses in Aquatic and Riparian Areas

1. The uses identified in Guideline 2 under "Review Uses," above, may be allowed only if they meet all of the following criteria:

    A. The proposed use is water-dependent, or is not water-dependent but has no practicable alternative. A local government may conclude that a practicable alternative to the proposed use does not exist if the "Practicable Alternative Test" in the "Wetlands" section of this chapter is satisfied, substituting the term "stream, pond, lake, or riparian area" as appropriate.

    B. The proposed use is in the public interest. In determining if a proposed use is in the public interest, the guidelines under "Public Interest Test" in the "Wetlands" section of this chapter shall be considered, substituting the term "stream, pond, lake, or riparian area" as appropriate.

    C. Measures have been applied to ensure that the proposed use results in minimum feasible impacts to water quality, natural drainage, and fish and wildlife habitat of the affected stream, pond, lake, and/or buffer zone. As a starting point, the following mitigation measures shall be considered when new uses are proposed in streams, ponds, lakes, and buffer zones:

        (1) Construction shall occur during periods when fish and wildlife are least sensitive to disturbance. In Oregon, work in streams, ponds, and lakes shall be conducted during the periods specified in *Oregon Guidelines for*

Timing of In-Water Work to Protect Fish and Wildlife Resources (Oregon Department of Fish and Wildlife 2000), unless otherwise coordinated with and approved by the Oregon Department of Fish and Wildlife. In Washington, the Washington Department of Fish and Wildlife shall evaluate specific proposals and specify periods for in-water work.

(2) All natural vegetation shall be retained to the greatest extent practicable, including aquatic and riparian vegetation.

(3) Nonstructural controls and natural processes shall be used to the greatest extent practicable.

(4) Bridges, roads, pipeline and utility corridors, and other water crossings shall be minimized and should serve multiple purposes and properties.

(5) Stream channels shall not be placed in culverts unless absolutely necessary for property access. Bridges are preferred for water crossings to reduce disruption to streams, ponds, lakes, and their banks. When culverts are necessary, oversized culverts with open bottoms that maintain the channel's width and grade should be used.

(6) Temporary and permanent control measures shall be applied to minimize erosion and sedimentation when riparian areas are disturbed, including slope netting, berms and ditches, tree protection, sediment barriers, infiltration systems, and culverts.

D. Groundwater and surface water quality will not be degraded by the proposed use.

E. Those portions of a proposed use that are not water-dependent or that have a practicable alternative will be located outside of stream, pond, and lake buffer zones.

F. The proposed use complies with all applicable federal, state, and local laws.

G. Unavoidable impacts to aquatic and riparian areas will be offset through rehabilitation and enhancement.

Rehabilitation and enhancement shall achieve no net loss of water quality, natural drainage, and fish and wildlife habitat of the affected stream, pond, lake, and/or buffer zone. When a project area has been disturbed in the past, it shall be rehabilitated to its natural condition to the maximum extent practicable.

When a project area cannot be completely rehabilitated, such as when a boat launch permanently displaces aquatic and riparian areas, enhancement shall also be required.

The following rehabilitation and enhancement guidelines shall apply:

(1) Rehabilitation and enhancement projects shall be conducted in accordance with a rehabilitation and enhancement plan.

(2) Natural hydrologic conditions shall be replicated, including current patterns, circulation, velocity, volume, and normal water fluctuation.

(3) Natural stream channel and shoreline dimensions shall be replicated, including depth, width, length, cross-sectional profile, and gradient.

(4) The bed of the affected aquatic area shall be rehabilitated with identical or similar materials.

(5) Riparian areas shall be rehabilitated to their original configuration, including slope and contour.

(6) Fish and wildlife habitat features shall be replicated, including pool-riffle ratios, substrata, and structures. Structures include large woody debris and boulders.

(7) Stream channels and banks, shorelines, and riparian areas shall be replanted with native plant species that replicate the original vegetation community.

(8) Rehabilitation and enhancement efforts shall be completed no later than 90 days after the aquatic area or buffer zone has been altered or destroyed, or as soon thereafter as is practicable.

(9) Three years after an aquatic area or buffer zone is rehabilitated or enhanced, at least 75 percent of the replacement vegetation must survive. The project applicant shall monitor the replacement vegetation and take corrective measures to meet this guideline.

Stream, Pond, and Lake Buffer Zones

1. Buffer zones shall generally be measured landward from the ordinary high watermark on a horizontal scale that is perpendicular to the ordinary high watermark. On the main stem of the Columbia River above Bonneville Dam, buffer zones shall be measured landward from the normal pool elevation of the Columbia River. The following buffer zone widths shall be required:

   A. Streams used by anadromous or resident fish (tributary fish habitat), special streams, intermittent streams that include year-round pools, and perennial streams: 100 feet.

B. Intermittent streams, provided they are not used by anadromous or resident fish: 50 feet.

C. Ponds and lakes: Buffer zone widths shall be based on the dominant vegetative community and shall use the same guidelines as in the "Wetlands Buffer Zones" section of this chapter, substituting the term "pond or lake" as appropriate.

2. Except as otherwise allowed, buffer zones shall be retained in their natural condition. When a buffer zone is disturbed by a new use, it shall be replanted with native plant species.

3. The project applicant shall be responsible for determining the exact location of the ordinary high watermark or normal pool elevation. The local government may verify the accuracy of, and render adjustments to, an ordinary high watermark or normal pool delineation. If the adjusted boundary delineation is contested by the project applicant, the local government shall obtain professional services to render a final delineation, at the project applicant's expense.

Rehabilitation and Enhancement Plans

1. Rehabilitation and enhancement plans shall be prepared when a project applicant is required to rehabilitate or enhance a stream, pond, lake, and/or buffer zone. They shall satisfy the following guidelines:

A. Rehabilitation and enhancement plans are the responsibility of the project applicant; they shall be prepared by qualified professionals, such as fish or wildlife biologists.

B. All plans shall include an assessment of the physical characteristics and natural functions of the affected stream, pond, lake, and/or buffer zone. The assessment shall include hydrology, flora, and fauna.

C. Plans shall include plan view and cross-sectional, scaled drawings; topographic survey data, including elevations at contour intervals of at least 2 feet, slope percentages, and final grade elevations; and other technical information in sufficient detail to explain and illustrate:

(1) Soil and substrata conditions, grading and excavation, and erosion and sediment control needed to successfully rehabilitate and enhance the stream, pond, lake, and buffer zone.

(2) Planting plans that specify native plant species, quantities, size, spacing, or density; source of plant materials or seeds; timing, season, water, and nutrient requirements for planting; and where appropriate, measures to protect plants from predation.

(3) Water-quality parameters, construction techniques, management measures, and design specifications needed to maintain hydrologic conditions and water quality.

D. A 3-year monitoring, maintenance, and replacement program shall be included in all rehabilitation and enhancement plans. At a minimum, a project applicant shall prepare an annual report that documents milestones, successes, problems, and contingency actions. Photographic monitoring shall be used to monitor all rehabilitation and enhancement efforts.

E. A project applicant shall demonstrate sufficient fiscal, administrative, and technical competence to successfully execute and monitor a rehabilitation and enhancement plan.

WILDLIFE HABITAT

GMA Goals

1. Ensure that new uses do not adversely affect sensitive wildlife areas and sites. "Sensitive wildlife areas" means the 17 land and water areas that are included in the wildlife inventory. (See Table 2.)

   "Sensitive wildlife sites" is used here in a generic sense to refer to sites that are used by species that are (1) listed as endangered or threatened pursuant to federal or state endangered species acts, (2) listed as endangered, threatened, sensitive, or candidate by the Washington Wildlife Commission, (3) listed as sensitive by the Oregon Fish and Wildlife Commission, or (4) considered to be of special interest to the public (limited to great blue heron, osprey, golden eagle, and prairie falcon). Updated lists of species included in (1), (2), and (3) above can be found on the websites for the Washington Department of Fish and Wildlife (Species of Concern list) and the Wildlife Division of Oregon Department of Fish and Wildlife. A list also is maintained by the USDA Forest Service – Scenic Area Office and available at the Gorge Commission office and on its website.

2. Enhance wildlife habitat that has been altered or destroyed by past uses.

GMA Objectives

1. Update the wildlife inventory as new areas and sites are discovered and federal or state wildlife lists are revised. This update will be conducted by the Gorge Commission.

2. Promote public programs that offer incentives to landowners who protect and enhance sensitive wildlife habitat. The Gorge Commission shall notify landowners whose property has been designated Large-Scale or Small-Scale Agriculture,

Commercial Forest Land, or Large or Small Woodland and contains a sensitive wildlife area or site. It shall inform landowners about the rationale for regulating new uses near sensitive wildlife habitat, including cultivation.

GMA Policies

1. Newly discovered sensitive wildlife areas and sites and wildlife species that are added to federal or state wildlife lists shall be protected.

2. To help ensure that wildlife species are not disturbed, the wildlife inventory shall be kept confidential.

3. Habitat areas of animal species that are classified as endangered or threatened by federal or state endangered species acts or the Washington Wildlife Commission may be designated Open Space. The guidelines in this chapter shall be used to protect other sensitive wildlife areas and sites.

4. New dwellings, fences, and land divisions shall be limited in deer and elk winter range and turkey habitat.

5. New and replacement fences in deer and elk winter range should be constructed so they do not present a major hazard to deer and elk.

6. On lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland that include deer and elk winter range or turkey habitat, new parcels shall be 40 acres or larger in the west end of the Scenic Area and 80 acres or larger in the east end of the Scenic Area. In Oregon, the division between the west and east end of the Scenic Area is the Hood River. In Washington, the White Salmon River is the line of division.

7. Proposed uses that would adversely affect sensitive wildlife areas or sites shall be prohibited. Uses adversely affect wildlife sites and areas when they compromise the integrity of an area or site, or occur during a time of the year when affected wildlife species are sensitive to disturbance.

8. Adequate buffer zones shall be maintained to protect sensitive wildlife areas or sites from new uses. The width of wildlife buffer zones shall be determined on a case-by-case basis and shall reflect the biology of the affected species and the characteristics of the project site and the proposed use.

9. The size, scope, configuration, density, and timing of new uses within wildlife buffer zones shall be regulated to protect sensitive wildlife species.

10. Site-specific management plans shall be required before most new uses will be allowed within wildlife buffer zones.

11. Rehabilitation and/or enhancement shall be required to offset unavoidable impacts to wildlife habitat that result from new uses.

GMA Guidelines

Review Uses

1. Except uses allowed outright, proposed uses may be allowed within 1,000 feet of a sensitive wildlife area or site, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and "Approval Criteria for Review Uses Near Sensitive Wildlife Areas and Sites" in this section. Updated lists of species included in sensitive wildlife sites can be found on the websites for the Washington Department of Fish and Wildlife (Species of Concern list) and the Wildlife Division of Oregon Department of Fish and Wildlife. A list also is maintained by the USDA Forest Service – Scenic Area Office and available at the Gorge Commission office and on its website.

Site Plans and Field Surveys for Review Uses Near Sensitive Wildlife Areas and Sites

1. In addition to the information required in all site plans, site plans for uses within 1,000 feet of a sensitive wildlife area or site shall include a map prepared at a scale of 1 inch equals 100 feet (1:1,200), or a scale providing greater detail.

2. A field survey to identify sensitive wildlife areas or sites shall be required for (1) land divisions that create four or more parcels, (2) recreation facilities that contain parking areas for more than 10 cars, overnight camping facilities, boat ramps, or visitor information and environmental education facilities, (3) public transportation facilities that are outside improved rights-of-way, (4) electric facilities, lines, equipment, and appurtenances that are 33 kilovolts or greater, and (5) communications, water and sewer, and natural gas transmission (as opposed to distribution) lines, pipes, equipment, and appurtenances and other project related activities, except when all of their impacts will occur inside previously disturbed road, railroad or utility corridors, or existing developed utility sites, that are maintained annually.

   Field surveys shall cover all areas affected by the proposed use or recreation facility. They shall be conducted by a professional wildlife biologist hired by the project applicant. All sensitive wildlife areas and sites discovered in a project area shall be described and shown on the site plan map.

Approval Criteria for Review Uses Near Sensitive Wildlife Areas and Sites

1. Uses that are proposed within 1,000 feet of a sensitive wildlife area or site shall be reviewed by the Oregon Department of Fish and Wildlife or the Washington Department of Fish and Wildlife. The approximate locations of sensitive wildlife

areas and sites are shown in the wildlife inventory. State wildlife biologists will help determine if a new use would adversely affect a sensitive wildlife area or site.

2. The local government shall submit site plans to the Oregon Department of Fish and Wildlife or Washington Department of Fish and Wildlife. State wildlife biologists shall review the site plan and their field survey records. They shall (1) identify/verify the precise location of the wildlife area or site, (2) ascertain whether the wildlife area or site is active or abandoned, and (3) determine if the proposed use may compromise the integrity of the wildlife area or site or occur during the time of year when wildlife species are sensitive to disturbance, such as nesting or rearing seasons. In some instances, state wildlife biologists may conduct field surveys to verify the wildlife inventory and assess the potential effects of a proposed use.

3. The following factors may be considered when site plans are reviewed:

   A. Biology of the affected wildlife species.

   B. Published guidelines regarding the protection and management of the affected wildlife species. The Oregon Department of Forestry has prepared technical papers that include management guidelines for osprey and great blue heron. The Washington Department of Fish and Wildlife has prepared similar guidelines for a variety of species, including the western pond turtle, the peregrine falcon, and the Larch Mountain salamander (Rodrick and Milner 1991).

   C. Physical characteristics of the subject parcel and vicinity, including topography and vegetation.

   D. Historic, current, and proposed uses in the vicinity of the sensitive wildlife area or site.

   E. Existing condition of the wildlife area or site and the surrounding habitat and the useful life of the area or site.

4. The wildlife protection process may terminate if the local government, in consultation with the state wildlife agency, determines (1) the sensitive wildlife area or site is not active, or (2) the proposed use would not compromise the integrity of the wildlife area or site or occur during the time of year when wildlife species are sensitive to disturbance.

5. If the local government, in consultation with the state wildlife agency, determines that the proposed use would have only minor effects on the wildlife area or site that could be eliminated through mitigation measures recommended by the state wildlife biologist, or by simply modifying the site plan or regulating the timing of new uses, a letter shall be sent to the project applicant that describes the effects and

measures needed to eliminate them. If the project applicant accepts these recommendations, the local government shall incorporate them into its development review order and the wildlife protection process may conclude.

6. The project applicant shall prepare a wildlife management plan if the local government, in consultation with the state wildlife agency, determines that the proposed use would adversely affect a sensitive wildlife area or site and the effects of the proposed use cannot be eliminated through site plan modifications or project timing.

7. The local government shall submit a copy of all field surveys and wildlife management plans to the Oregon Department of Fish and Wildlife or Washington Department of Fish and Wildlife. The state wildlife agency will have 20 days from the date that a field survey or management plan is mailed to submit written comments to the local government.

   The local government shall record and address any written comments submitted by the state wildlife agency in its development review order.

   Based on the comments from the state wildlife agency, the local government shall make a final decision on whether the proposed use would be consistent with the wildlife policies and guidelines. If the final decision contradicts the comments submitted by the state wildlife agency, the local government shall justify how it reached an opposing conclusion.

8. The local government shall require the project applicant to revise the wildlife management plan as necessary to ensure that the proposed use would not adversely affect a sensitive wildlife area or site.

Wildlife Management Plans

1. Wildlife management plans shall be prepared when a proposed use is likely to adversely affect a sensitive wildlife area or site. Their primary purpose is to document the special characteristics of a project site and the habitat requirements of affected wildlife species. This information provides a basis for the project applicant to redesign the proposed use in a manner that protects sensitive wildlife areas and sites, maximizes his/her development options, and mitigates temporary impacts to the wildlife area or site and/or buffer zone.

2. Wildlife management plans shall comply with the following guidelines:

   A. Wildlife management plans shall be prepared by a professional wildlife biologist hired by the project applicant.

   B. All relevant background information shall be documented and considered, including biology of the affected species, published protection and management

guidelines, physical characteristics of the subject parcel, past and present use of the subject parcel, and useful life of the wildlife area or site.

C. The core habitat of the sensitive wildlife species shall be delineated. It shall encompass the sensitive wildlife area or site and the attributes, or key components that are essential to maintain the long-term use and integrity of the wildlife area or site.

D. A wildlife buffer zone shall be employed. It shall be wide enough to ensure that the core habitat is not adversely affected by new uses, or natural forces, such as fire and wind. Buffer zones shall be delineated on the site plan map and shall reflect the physical characteristics of the project site and the biology of the affected species.

E. The size, scope, configuration, or density of new uses within the core habitat and the wildlife buffer zone shall be regulated to protect sensitive wildlife species. The timing and duration of all uses shall also be regulated to ensure that they do not occur during the time of year when wildlife species are sensitive to disturbance. The following guidelines shall apply:

(1) New uses shall generally be prohibited within the core habitat. Exceptions may include uses that have temporary and negligible effects, such as the installation of minor underground utilities or the maintenance of existing structures. Low-intensity, nondestructive uses may be conditionally authorized in the core habitat.

(2) Intensive uses shall be generally prohibited in wildlife buffer zones. Such uses may be conditionally authorized when a wildlife area or site is inhabited seasonally, provided they will have only temporary effects on the wildlife buffer zone and rehabilitation and/or enhancement will be completed before a particular species returns.

F. Rehabilitation and/or enhancement shall be required when new uses are authorized within wildlife buffer zones. When a buffer zone has been altered or degraded in the past, it shall be rehabilitated to its natural condition to the maximum extent practicable. When complete rehabilitation is not possible, such as when new structures permanently displace wildlife habitat, enhancement shall also be required. Enhancement shall achieve no net loss of the integrity of the wildlife area or site.

Rehabilitation and enhancement actions shall be documented in the wildlife management plan and shall include a map and text.

G. The project applicant shall prepare and implement a 3-year monitoring plan when the affected wildlife area or site is occupied by a species that is listed as endangered or threatened pursuant to federal or state wildlife lists. At a

minimum, the project applicant shall prepare an annual report and shall track the status of the wildlife area or site and the success of rehabilitation and/or enhancement actions.

At the end of 3 years, rehabilitation and enhancement efforts may conclude if they are successful. In instances where rehabilitation and enhancement efforts have failed, the monitoring process shall be extended until the applicant satisfies the rehabilitation and enhancement guidelines.

Approval Criteria for Fences in Deer and Elk Winter Range

New fences in deer and elk winter range shall comply with the following guidelines:

1. New fences in deer and elk winter range shall be allowed only when necessary to control livestock or exclude wildlife from specified areas, such as gardens or sensitive wildlife sites. The areas fenced shall be the minimum necessary to meet the immediate needs of the project applicant.

2. New and replacement fences that are allowed in winter range shall comply with the guidelines in *Specifications for Structural Range Improvements* (Sanderson et al. 1990), as summarized below, unless the project applicant demonstrates the need for an alternative design:

   A. To make it easier for deer to jump over the fence, the top wire shall not be more than 42 inches high.

   B. The distance between the top two wires is critical for adult deer because their hind legs often become entangled between these wires. A gap of at least 10 inches shall be maintained between the top two wires to make it easier for deer to free themselves if they become entangled.

   C. The bottom wire shall be at least 16 inches above the ground to allow fawns to crawl under the fence. It shall consist of smooth wire because barbs often injure animals as they crawl under fences.

   D. Stays, or braces placed between strands of wire, shall be positioned between fence posts where deer are most likely to cross. Stays create a more rigid fence, which allows deer a better chance to wiggle free if their hind legs become caught between the top two wires.

3. Woven wire fences may be authorized only when a project applicant clearly demonstrates that such a fence is required to meet his/her specific and immediate needs, such as controlling hogs and sheep.

RARE PLANTS

GMA Goals

1. Ensure that new uses do not adversely affect plant species that are (1) endemic to the Columbia River Gorge and vicinity (see Table 3), (2) listed as endangered or threatened pursuant to federal or state endangered species acts, or (3) listed as endangered, threatened, or sensitive by the Oregon or Washington Natural Heritage Program. For brevity, these species will be referred to as "sensitive" plant species. Updated lists of sensitive plant species included in (2) and (3) above can be found on the websites for the Oregon or Washington Natural Heritage Program. A list also is maintained by the USDA Forest Service – Scenic Area Office and available at the Gorge Commission office and on its website.

2. Encourage the protection of plant species that are classified as "List 3 (Review)" or "List 4 (Watch)" by the Oregon Natural Heritage Program or "Monitor" by the Washington Natural Heritage Program.

3. Enhance the natural habitat of rare plant species.

GMA Objectives

1. Update the rare plant species inventory as new plant sites are discovered and federal or state rare plant lists are revised. The update will be conducted by the Gorge Commission.

2. Promote public programs that offer incentives to landowners who protect and enhance sensitive plants. The Gorge Commission shall notify landowners whose property has been designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland and contains sensitive plant species. It shall inform landowners about the values of sensitive plants and the rationale for regulating new uses near sensitive plant sites, including cultivation.

GMA Policies

1. Newly discovered rare plant sites and plant species that are added to federal or state rare plant lists shall be protected. Species that are deleted from federal or state rare plant lists will not require further protection.

2. The rare plant species inventory shall be used to identify possible conflicts between proposed uses and rare plant sites. Project applicants should consult the local government early in the planning process to help determine if rare plants exist in the project area.

3. When new uses are proposed near a sensitive plant site that appears in the rare plant species inventory, the field survey records shall be used to determine the precise location of the plant population in relation to the proposed use. If the field survey records are inadequate, a field survey shall be conducted to delineate the boundaries of the sensitive plant population.

4. Buffer zones shall be used to ensure that new uses do not adversely affect sensitive plant species.

5. Except for uses allowed outright, new uses shall be prohibited within sensitive plant species buffer zones.

6. Landowners and agency officials shall be encouraged to avoid siting new uses on lands containing plant species listed as "Review," "Watch," or "Monitor" by the Oregon or Washington Natural Heritage Program.

GMA Guidelines

Review Uses

1. Except uses allowed outright, proposed uses may be allowed within 1,000 feet of a sensitive plant, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and "Approval Criteria for Review Uses Near Sensitive Plants" in this section. Updated lists of sensitive plant species can be found on the websites for the Oregon or Washington Natural Heritage Program. A list also is maintained by the USDA Forest Service – Scenic Area Office and available at the Gorge Commission office and on its website.

Site Plans and Field Surveys for Review Uses Near Sensitive Plants

1. In addition to the information required in all site plans, site plans for uses within 1,000 feet of a sensitive plant shall include a map prepared at a scale of 1 inch equals 100 feet (1:1,200), or a scale providing greater detail.

2. A field survey to identify sensitive plants shall be required for (1) land divisions that create four or more parcels; (2) recreation facilities that contain parking areas for more than 10 cars, overnight camping facilities, boat ramps, or visitor information and environmental education facilities; (3) public transportation facilities that are outside improved rights-of-way; (4) electric facilities, lines, equipment, and appurtenances that are 33 kilovolts or greater; and (5) communications, water and sewer, and natural gas transmission (as opposed to distribution) lines, pipes, equipment, and appurtenances and other project related activities, except when all of their impacts will occur inside previously disturbed road, railroad or utility corridors, or existing developed utility sites, that are maintained annually.

Field surveys shall cover all areas affected by the proposed use or recreation facility. They shall be conducted by a person with recognized expertise in botany or plant ecology hired by the project applicant. Field surveys shall identify the precise location of the sensitive plants and delineate a 200-foot buffer zone. The results of a field survey shall be shown on the site plan map.

Approval Criteria for Review Uses Near Sensitive Plants

1. Uses that are proposed within 1,000 feet of a sensitive plant shall be reviewed by the Oregon or Washington Natural Heritage Program. The approximate locations of sensitive plants are shown in the rare plant species inventory. State heritage staffs will help determine if a new use would invade the buffer zone of sensitive plants.

2. The local government shall submit site plans to the state heritage program. The state heritage staffs will review the site plan and their field survey records. They will identify the precise location of the affected plants and delineate a 200-foot buffer zone on the project applicant's site plan.

   If the field survey records of the state heritage program are inadequate, the project applicant shall hire a person with recognized expertise in botany or plant ecology to ascertain the precise location of the affected plants.

3. The rare plant protection process may conclude if the local government, in consultation with the state heritage program, determines that the proposed use would be located outside of a sensitive plant buffer zone.

4. New uses shall be prohibited within sensitive plant species buffer zones, except for those uses that are allowed outright.

5. If a proposed use must be allowed within a sensitive plant buffer zone in accordance with the provisions in "Variances for Setbacks and Buffers" in Part II, Chapter 7: General Policies and Guidelines, the project applicant shall prepare a protection and rehabilitation plan that complies with the guidelines in "Protection and Rehabilitation Plans" in this section.

6. The local government shall submit a copy of all field surveys and protection and rehabilitation plans to the Oregon or Washington Natural Heritage Program. The state heritage program will have 20 days from the date that a field survey is mailed to submit written comments to the local government.

   The local government shall record and address any written comments submitted by the state heritage program in its development review order.

   Based on the comments from the state heritage program, the local government will make a final decision on whether the proposed use would be consistent with the rare plant policies and guidelines. If the final decision contradicts the comments

submitted by the state heritage program, the local government shall justify how it reached an opposing conclusion.

Sensitive Plant Buffer Zones

1. A 200-foot buffer zone shall be maintained around sensitive plants. Buffer zones shall remain in an undisturbed, natural condition.

2. Buffer zones may be reduced if a project applicant demonstrates that intervening topography, vegetation, manmade features, or natural plant habitat boundaries negate the need for a 200-foot radius. Under no circumstances shall the buffer zone be less than 25 feet.

3. Requests to reduce buffer zones shall be considered if a professional botanist or plant ecologist hired by the project applicant (1) identifies the precise location of the sensitive plants, (2) describes the biology of the sensitive plants, and (3) demonstrates that the proposed use will not have any negative effects, either direct or indirect, on the affected plants and the surrounding habitat that is vital to their long-term survival.

   All requests shall be prepared as a written report. Published literature regarding the biology of the affected plants and recommendations regarding their protection and management shall be cited. The report shall include detailed maps and photographs.

4. The local government shall submit all requests to reduce sensitive plant species buffer zones to the Oregon or Washington Natural Heritage Program. The state heritage program will have 20 days from the date that such a request is mailed to submit written comments to the local government.

   The local government shall record and address any written comments submitted by the state heritage program in its development review order.

   Based on the comments from the state heritage program, the local government will make a final decision on whether the reduced buffer zone is justified. If the final decision contradicts the comments submitted by the state heritage program, the local government shall justify how it reached an opposing conclusion.

Protection and Rehabilitation Plans

1. Protection and rehabilitation plans shall minimize and offset unavoidable impacts that result from a new use that occurs within a sensitive plant buffer zone as the result of a variance. All plans shall meet the following guidelines:

   A. Protection and rehabilitation plans shall be prepared by a professional botanist or plant ecologist hired by the project applicant.

B. Construction, protection, and rehabilitation activities shall occur during the time of year when ground disturbance will be minimized and protection, rehabilitation, and replacement efforts will be maximized.

C. Sensitive plants that will be destroyed shall be transplanted or replaced, to the maximum extent practicable. Replacement is used here to mean the establishment of a particular plant species in areas of suitable habitat not affected by new uses. Replacement may be accomplished by seeds, cuttings, or other appropriate methods.

   Replacement shall occur as close to the original plant site as practicable. The project applicant shall ensure that at least 75 percent of the replacement plants survive 3 years after the date they are planted.

D. Sensitive plants and their surrounding habitat that will not be altered or destroyed shall be protected and maintained. Appropriate protection and maintenance techniques shall be applied, such as fencing, conservation buffers, livestock management, and noxious weed control.

E. Habitat of a sensitive plant that will be affected by temporary uses shall be rehabilitated to a natural condition.

F. Protection efforts shall be implemented before construction activities begin. Rehabilitation efforts shall be implemented immediately after the plants and their surrounding habitat are disturbed.

2. Protection and rehabilitation plans shall include maps, photographs, and text. The text shall:

   A. Describe the biology of sensitive plant species that will be affected by a proposed use.

   B. Explain the techniques that will be used to protect sensitive plants and their surrounding habitat that will not be altered or destroyed.

   C. Describe the rehabilitation and enhancement actions that will minimize and offset the impacts that will result from a proposed use.

   D. Include a 3-year monitoring, maintenance, and replacement program. The project applicant shall prepare and submit to the local government an annual report that documents milestones, successes, problems, and contingency actions.

SMA PROVISIONS

WATER RESOURCES (WETLANDS, STREAMS, PONDS, LAKES, AND RIPARIAN AREAS)

SMA Goal

1. Protect and enhance the quantity and quality of water resources and their functions.

SMA Policies

1. All wetlands, regardless of their size or functions, warrant protection from new uses that may alter or destroy wetlands functions.

2. The National Wetlands Inventory (U.S. Department of the Interior 1987) and the list of hydric soils shall be used as a general guide to the location of wetlands; additional wetlands are assumed to exist and shall be protected.

3. The exact location of wetlands boundaries shall be delineated using the procedures specified in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987 Corps of Engineers Wetland Delineation Manual, on-line edition.

4. An undisturbed buffer should be preserved around wetlands, streams, ponds, and lakes to protect and enhance their functions and associated uplands.

5. Uses that may impact wetland, streams, ponds, lakes, and riparian areas acreage and functions, water quality, natural drainage, or wildlife habitat may be allowed in their buffer zones, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and the approval criteria in this section.

6. A project applicant shall minimize and offset unavoidable impacts to aquatic areas and their buffer zones that result from his/her actions by rehabilitating or enhancing aquatic and riparian areas or by restoring, creating, and enhancing wetlands.

7. When uses are authorized in degraded aquatic and riparian areas, rehabilitation shall return the project area to its natural condition to the maximum extent practicable.

8. Project proposals affecting wetlands shall be coordinated with federal and state agencies that regulate new uses in wetlands.

9. Enhancement of wetlands, streams, ponds, lakes, and riparian areas not associated with any other project proposal may be allowed, if such efforts comply with the wetlands, streams, ponds, lakes, and riparian areas provisions in the

Management Plan. Enhancement efforts shall be conducted pursuant to a mitigation plan, as described in this section.

10. All mitigation plans must be approved by the local government, after consultation with federal and state agencies with jurisdiction over wetlands.

11. Partnerships with public agencies, conservation groups, and individuals are encouraged to increase public awareness, understanding, and stewardship of natural resources.

12. The Special Management Area water resource buffer widths shall be applied to National Forest System lands in the General Management Area.

WILDLIFE AND PLANTS

SMA Goals

1. Protect (ensure that new uses do not adversely affect, including cumulative effects) and enhance the wildlife and plant diversity of the Gorge.

2. Encourage the protection of plant species that are classified as "List 3 (Review)" or "List 4 (Watch)" by the Oregon Natural Heritage Program or "Monitor" by the Washington Natural Heritage Program.

3. Ensure that new uses do not adversely affect natural areas that are potentially eligible for the Oregon Register of Natural Heritage Resources or the Washington Register of Natural Areas Program.

SMA Policies

1. Natural resources existing on a site proposed for a new development or land use, and/or natural resources in danger of degradation or destruction from individual or cumulative off-site impacts, shall be protected from adverse effects.

2. Significant ecosystems such as natural areas, wetlands, ponds, lakes, riparian areas, old growth forests, islands, and areas of special importance such as botanical areas, sensitive wildlife and fishery habitats, or oak woodlands shall be protected from adverse effects.

3. Existing habitat quality, viable populations, and long-term productivity of natural resources and ecosystem diversity shall be maintained.

4. County, state, and federal regulations for air and water quality and for pesticide use shall be followed.

5. Newly discovered sensitive wildlife and plant species, areas and sites that are added to federal or state wildlife and plant lists shall be protected. Species that are deleted from federal or state wildlife and plant lists will not require further protection. Updated lists of sensitive wildlife and plant species can be found on websites for the Washington Department of Fish and Wildlife, the Wildlife Division of Oregon Department of Fish and Wildlife, and the Oregon or Washington Natural Heritage Programs. A list also is maintained by the USDA Forest Service – Scenic Area Office and available at the Gorge Commission office and on its website.

6. To help ensure that sensitive wildlife and plant species are not disturbed, the sensitive wildlife and plant inventory shall be kept confidential.

7. Habitat areas of animal species that are classified as endangered or threatened by federal or state endangered species acts or the Washington Wildlife Commission may be designated Open Space; the guidelines in this chapter shall be used to protect other sensitive wildlife areas and sites.

8. Proposed uses that would adversely affect sensitive wildlife or plant areas or sites shall be prohibited. Uses adversely affect wildlife or plant sites and areas when they compromise the integrity of an area or site, or occur during a time of the year when affected wildlife or plant species are sensitive to disturbance.

9. Adequate buffer zones shall be maintained to protect sensitive wildlife and plant areas or sites from new uses. The width of wildlife buffer zones shall be determined on a case-by-case basis and shall reflect the biology of the affected species and the characteristics of the project site and the proposed use. The width of the plant buffer zone shall be 200 ft.

10. The size, scope, configuration, density, and timing of new uses within wildlife and plant buffer zones shall be regulated to protect sensitive wildlife species.

11. Site-specific plans shall be required before most new uses will be allowed within wildlife and plant buffer zones.

12. Rehabilitation and/or enhancement shall be required to offset unavoidable impacts to wildlife and plant habitat that result from new uses.

13. Natural areas that are potentially eligible for the Oregon Register of Natural Heritage Resources or the Washington Register of Natural Areas Program shall be designated as Open Space in the SMA.

14. Partnerships with public agencies, conservation groups, and individuals are encouraged to increase public awareness, understanding, and stewardship of natural resources.

15. Air quality shall be protected and enhanced, consistent with the purposes of the Scenic Area Act. The States of Oregon and Washington and the U.S. Forest Service shall:

(1) Continue to monitor air pollution and visibility levels in the Gorge;

(2) Conduct an analysis of monitoring and emissions data to identify all sources, both inside and outside the Scenic Area, that significantly contribute to air pollution. Based on this analysis, the States shall develop and implement a regional air quality strategy to carry out the purposes of the Scenic Area Act, with the U.S. Forest Service, the Southwest Air Pollution Control Authority and in consultation with affected stakeholders.

The States and the Forest Service shall together provide annual reports to the Commission on progress made regarding implementation of this policy. The first report shall include a workplan and timeline for gathering/analyzing data and developing and implementing the strategy. The workplan and strategy shall be submitted to the Commission for approval.

SMA Guidelines

1. All new developments and uses, as described in a site plan prepared by the applicant, shall be evaluated using the following guidelines to ensure that natural resources are protected from adverse effects. Comments from state and federal agencies shall be carefully considered. (Site plans are described under "Review Uses" in Part II, Chapter 7: General Policies and Guidelines.)

2. Water Resources (Wetlands, Streams, Ponds, Lakes, and Riparian Areas)

   A. All Water Resources shall, in part, be protected by establishing undisturbed buffer zones as specified in 2.A.(2)(a) and 2(b) below. These buffer zones are measured horizontally from a wetland, stream, lake, or pond boundary as defined below.

      (1) All buffer zones shall be retained undisturbed and in their natural condition, except as permitted with a mitigation plan.

      (2) Buffer zones shall be measured outward from the bank full flow boundary for streams, the high water mark for ponds and lakes, the normal pool elevation for the Columbia River, and the wetland delineation boundary for wetlands on a horizontal scale that is perpendicular to the wetlands, stream, pond or lake boundary. On the main stem of the Columbia River above Bonneville Dam, buffer zones shall be measured landward from the normal pool elevation of the Columbia River. The following buffer zone widths shall be required:

         (a) A minimum 200 foot buffer on each wetland, pond, lake, and each bank of a perennial or fish bearing stream, some of which can be intermittent.

(b) A 50-foot buffer zone along each bank of intermittent (including ephemeral), non-fish bearing streams.

(c) Maintenance, repair, reconstruction and realignment of roads and railroads within their rights-of-way shall be exempted from the wetlands and riparian guidelines upon demonstration of all of the following:

(i) The wetland within the right-of-way is a drainage ditch not part of a larger wetland outside of the right-of-way.

(ii) The wetland is not critical habitat.

(iii) Proposed activities within the right-of-way would not adversely affect a wetland adjacent to the right-of-way.

(3) The buffer width shall be increased for the following:

(a) When the channel migration zone exceeds the recommended buffer width, the buffer width shall extend to the outer edge of the channel migration zone.

(b) When the frequently flooded area exceeds the recommended riparian buffer zone width, the buffer width shall be extended to the outer edge of the frequently flooded area.

(c) When an erosion or landslide hazard area exceeds the recommended width of the buffer, the buffer width shall be extended to include the hazard area.

(4) Buffer zones can be reconfigured if a project applicant demonstrates all of the following: (1) the integrity and function of the buffer zone is maintained, (2) the total buffer area on the development proposal is not decreased, (3) the width reduction shall not occur within another buffer, and (4) the buffer zone width is not reduced more than 50% at any particular location. Such features as intervening topography, vegetation, man made features, natural plant or wildlife habitat boundaries, and flood plain characteristics could be considered.

(5) Requests to reconfigure buffer zones shall be considered if an appropriate professional (botanist, plant ecologist, wildlife biologist, or hydrologist) hired by the project applicant (1) identifies the precise location of the sensitive wildlife/plant or water resource, (2) describes the biology of the sensitive wildlife/plant or hydrologic condition of the water resource, and (3) demonstrates that the proposed use will not have any negative effects, either direct or indirect, on the affected wildlife/plant

and their surrounding habitat that is vital to their long-term survival or water resource and its long-term function.

(6) The local government shall submit all requests to re-configure sensitive wildlife/plant or water resource buffers to the Forest Service and the appropriate state agencies for review. All written comments shall be included in the project file. Based on the comments from the state and federal agencies, the local government will make a final decision on whether the reconfigured buffer zones are justified. If the final decision contradicts the comments submitted by the federal and state agencies, the local government shall justify how it reached an opposing conclusion.

B. When a buffer zone is disturbed by a new use, it shall be replanted with only native plant species of the Columbia River Gorge.

C. The applicant shall be responsible for identifying all water resources and their appropriate buffers (see above).

D. Wetlands Boundaries shall be delineated using the following:

(1) The approximate location and extent of wetlands in the Scenic Area is shown on the National Wetlands Inventory (U.S. Department of the Interior, 1987). In addition, the list of hydric soils and the soil survey maps shall be used as an indicator of wetlands.

(2) Some wetlands may not be shown on the wetlands inventory or soil survey maps. Wetlands that are discovered by the local planning staff during an inspection of a potential project site shall be delineated and protected.

(3) The project applicant shall be responsible for determining the exact location of a wetlands boundary. Wetlands boundaries shall be delineated using the procedures specified in the '1987 Corps of Engineers Wetland Delineation Manual (on-line edition)'.

(4) All wetlands delineations shall be conducted by a professional who has been trained to use the federal delineation procedures, such as a soil scientist, botanist, or wetlands ecologist.

E. Stream, pond, and lake boundaries shall be delineated using the bank full flow boundary for streams and the high water mark for ponds and lakes. The project applicant shall be responsible for determining the exact location of the appropriate boundary for the water resource.

F. The local government may verify the accuracy of, and render adjustments to, a bank full flow, high water mark, normal pool elevation (for the Columbia River), or wetland boundary delineation. If the adjusted boundary is contested

by the project applicant, the local government shall obtain professional services, at the project applicant's expense, or the local government will ask for technical assistance from the Forest Service to render a final delineation.

G. Buffer zones shall be undisturbed unless the following criteria have been satisfied:

(1) The proposed use must have no practicable alternative as determined by the practicable alternative test.

Those portions of a proposed use that have a practicable alternative will not be located in wetlands, stream, pond, lake, and riparian areas and/or their buffer zone.

(2) Filling and draining of wetlands shall be prohibited with exceptions related to public safety or restoration/enhancement activities as permitted when all of the following criteria have been met:

(a) A documented public safety hazard exists or a restoration/ enhancement project exists that would benefit the public and is corrected or achieved only by impacting the wetland in question, and

(b) Impacts to the wetland must be the last possible documented alternative in fixing the public safety concern or completing the restoration/enhancement project, and

(c) The proposed project minimizes the impacts to the wetland.

(3) Unavoidable impacts to wetlands and aquatic and riparian areas and their buffer zones shall be offset by deliberate restoration and enhancement or creation (wetlands only) measures as required by the completion of a mitigation plan.

H. Determination of potential natural resources effects shall include consideration of cumulative effects of proposed developments within the following areas: wetlands, streams, ponds, lakes, riparian areas and their buffer zones. *(Added: U.S. Sec. Ag. concurrence 7/1/11)*

3. Wildlife and Plants

A. Protection of sensitive wildlife/plant areas and sites shall begin when proposed new developments or uses are within 1000 ft of a sensitive wildlife/plant site and/or area.

Sensitive Wildlife Areas are those areas depicted in the wildlife inventory and listed in Table 2, including all Priority Habitats listed in this Chapter. The

approximate locations of sensitive wildlife and/or plant areas and sites are shown in the wildlife and rare plant inventory.

B. The local government shall submit site plans (of uses that are proposed within 1,000 feet of a sensitive wildlife and/or plant area or site) for review to the Forest Service and the appropriate state agencies (Oregon Department of Fish and Wildlife or the Washington Department of Wildlife for wildlife issues and by the Oregon or Washington Natural Heritage Program for plant issues).

C. The Forest Service wildlife biologists and/or botanists, in consultation with the appropriate state biologists, shall review the site plan and their field survey records. They shall:

(1) Identify/verify the precise location of the wildlife and/or plant area or site,

(2) Determine if a field survey will be required,

(3) Determine, based on the biology and habitat requirements of the affected wildlife/plant species, if the proposed use would compromise the integrity and function of or result in adverse effects (including cumulative effects) to the wildlife or plant area or site. This would include considering the time of year when wildlife or plant species are sensitive to disturbance, such as nesting and rearing seasons, or flowering season, and

(4) Delineate the undisturbed 200 ft buffer on the site plan for sensitive plants and/or the appropriate buffer for sensitive wildlife areas or sites, including nesting, roosting and perching sites.

(a) Buffer zones can be reconfigured if a project applicant demonstrates all of the following: (1) the integrity and function of the buffer zones is maintained, (2) the total buffer area on the development proposal is not decreased, (3) the width reduction shall not occur within another buffer, and (4) the buffer zone width is not reduced more than 50% at any particular location. Such features as intervening topography, vegetation, man made features, natural plant or wildlife habitat boundaries, and flood plain characteristics could be considered.

(b) Requests to reduce buffer zones shall be considered if an appropriate professional (botanist, plant ecologist, wildlife biologist, or hydrologist), hired by the project applicant, (1) identifies the precise location of the sensitive wildlife/plant or water resource, (2) describes the biology of the sensitive wildlife/plant or hydrologic condition of the water resource, and (3) demonstrates that the proposed use will not have any negative effects, either direct or indirect, on the affected

wildlife/plant and their surrounding habitat that is vital to their long-term survival or water resource and its long-term function.

(c) The local government shall submit all requests to re-configure sensitive wildlife/plant or water resource buffers to the Forest Service and the appropriate state agencies for review. All written comments shall be included in the record of application and based on the comments from the state and federal agencies, the local government will make a final decision on whether the reduced buffer zone is justified. If the final decision contradicts the comments submitted by the federal and state agencies, the local government shall justify how it reached an opposing conclusion.

D. The local government, in consultation with the State and federal wildlife biologists and/or botanists, shall use the following criteria in reviewing and evaluating the site plan to ensure that the proposed developments or uses do not compromise the integrity and function of or result in adverse affects to the wildlife or plant area or site:

(1) Published guidelines regarding the protection and management of the affected wildlife/plant species. Examples include: the Oregon Department of Forestry has prepared technical papers that include management guidelines for osprey and great blue heron; the Washington Department of Wildlife has prepared similar guidelines for a variety of species, including the western pond turtle, the peregrine falcon, and the Larch Mountain salamander.

(2) Physical characteristics of the subject parcel and vicinity, including topography and vegetation.

(3) Historic, current, and proposed uses in the vicinity of the sensitive wildlife/plant area or site.

(4) Existing condition of the wildlife/plant area or site and the surrounding habitat and the useful life of the area or site.

(5) In areas of winter range, habitat components, such as forage and thermal cover, important to the viability of the wildlife must be maintained or, if impacts are to occur, enhancement must mitigate the impacts so as to maintain overall values and function of winter range.

(6) The site plan is consistent with the "Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources" (Oregon Department of Fish and Wildlife 2000) and the Washington guidelines when they become finalized.

(7) The site plan activities coincide with periods when fish and wildlife are least sensitive to disturbance. These would include, among others, nesting and brooding periods (from nest building to fledgling of young) and those periods specified.

(8) The site plan illustrates that new developments and uses, including bridges, culverts, and utility corridors, shall not interfere with fish and wildlife passage.

(9) Maintain, protect, and enhance the integrity and function of Priority Habitats (such as old growth forests, talus slopes, and oak woodlands) as listed on the following Priority Habitats Table. This includes maintaining structural, species, and age diversity, maintaining connectivity within and between plant communities, and ensuring that cumulative impacts are considered in documenting integrity and function.

PRIORITY HABITATS TABLE	
Priority Habitats	**Criteria**
Aspen stands	High fish and wildlife species diversity, limited availability, high vulnerability to habitat alteration.
Caves	Significant wildlife breeding habitat, limited availability, dependent species.
Old-growth forest	High fish and wildlife density, species diversity, breeding habitat, seasonal ranges, and limited and declining availability, high vulnerability.
Oregon white oak woodlands	Comparatively high fish and wildlife density, species diversity, declining availability, high vulnerability.
Prairies and steppe	Comparatively high fish and wildlife density, species diversity, important breeding habitat, declining and limited availability, high vulnerability.
Riparian	High fish and wildlife density, species diversity, breeding habitat, movement corridor, high vulnerability, dependent species.
Wetlands	High species density, high species diversity, important breeding habitat and seasonal ranges, limited availability, high vulnerability.
Snags and logs	High fish and wildlife density, species diversity, limited availability, high vulnerability, dependent species.
Talus	Limited availability, unique and dependent species, high vulnerability.
Cliffs	Significant breeding habitat, limited availability, dependent species.
Dunes	Unique species habitat, limited availability, high vulnerability, dependent species.

E. The wildlife/plant protection process may terminate if the local government, in consultation with the Forest Service and state wildlife agency or Heritage program, determines (1) the sensitive wildlife area or site is not active, or (2) the proposed use is not within the buffer zones and would not compromise the integrity of the wildlife/plant area or site, and (3) the proposed use is within the buffer and could be easily moved out of the buffer by simply modifying the project proposal (site plan modifications). If the project applicant accepts these recommendations, the local government shall incorporate them into its development review order and the wildlife/plant protection process may conclude.

F. If the above measures fail to eliminate the adverse affects, the proposed project shall be prohibited, unless the project applicant can meet the Practicable Alternative Test and prepare a mitigation plan to offset the adverse effects by deliberate restoration and enhancement.

G. The local government shall submit a copy of all field surveys (if completed) and mitigation plans to the Forest Service and appropriate state agencies. The local government shall include all comments in the record of application and address any written comments submitted by the state and federal wildlife agency/heritage programs in its development review order.

Based on the comments from the state and federal wildlife agency/heritage program, the local government shall make a final decision on whether the proposed use would be consistent with the wildlife/plant policies and guidelines. If the final decision contradicts the comments submitted by the state and federal wildlife agency/heritage program, the local government shall justify how it reached an opposing conclusion.

H. The local government shall require the project applicant to revise the mitigation plan as necessary to ensure that the proposed use would not adversely affect a sensitive wildlife/plant area or site.

I. Determination of potential natural resources effects shall include consideration of cumulative effects of proposed developments within the following areas: 1) sites within 1,000 feet of sensitive wildlife areas and sites; and 2) sites within 1,000 feet of rare plants. *(Added: U.S. Sec. Ag. concurrence 7/1/11)*

4. Soil Productivity

A. Soil productivity shall be protected using the following guidelines:

(1) A description or illustration showing the mitigation measures to control soil erosion and stream sedimentation.

(2) New developments and land uses shall control all soil movement within the area shown on the site plan.

(3) The soil area disturbed by new development or land uses, except for new cultivation, shall not exceed 15 percent of the project area.

(4) Within 1 year of project completion, 80 percent of the project area with surface disturbance shall be established with effective native ground cover species or other soil-stabilizing methods to prevent soil erosion until the area has 80 percent vegetative cover.

Practicable Alternative Test

1. An alternative site for a proposed use shall be considered practicable if it is available and the proposed use can be undertaken on that site after taking into consideration cost, technology, logistics, and overall project purposes.

   A practicable alternative does not exist if a project applicant satisfactorily demonstrates all of the following:

   A. The basic purpose of the use cannot be reasonably accomplished using one or more other sites in the vicinity that would avoid or result in less adverse effects on wetlands, ponds, lakes, riparian areas, wildlife or plant areas and/or sites.

   B. The basic purpose of the use cannot be reasonably accomplished by reducing its proposed size, scope, configuration, or density, or by changing the design of the use in a way that would avoid or result in less adverse effects on wetlands, ponds, lakes, riparian areas, wildlife or plant areas and/or sites.

   C. Reasonable attempts were made to remove or accommodate constraints that caused a project applicant to reject alternatives to the proposed use. Such constraints include inadequate infrastructure, parcel size, and land use designations. If a land use designation or recreation intensity class is a constraint, an applicant must request a Management Plan amendment to demonstrate that practicable alternatives do not exist.

Mitigation Plan

1. Mitigation Plans shall be prepared when:

   A. The proposed development or use is within a buffer zone (wetlands, ponds, lakes, riparian areas, wildlife or plant areas and/or sites).

   B. There is no practicable alternative (see the “practicable alternative” test).

2. In all cases, Mitigation Plans are the responsibility of the applicant and shall be prepared by an appropriate professional (botanist/ecologist for plant sites, a wildlife/fish biologist for wildlife/fish sites, and a qualified professional for water resource sites).

3. The primary purpose of this information is to provide a basis for the project applicant to redesign the proposed use in a manner that protects sensitive water resources and wildlife/plant areas and sites, that maximizes his/her development options, and that mitigates, through restoration, enhancement, and replacement measures, impacts to the water resources and/or wildlife/plant area or site and/or buffer zones.

4. The applicant shall submit the mitigation plan to the local government. The local government shall submit a copy of the mitigation plan to the Forest Service, and appropriate state agencies. If the final decision contradicts the comments submitted by the state and federal wildlife agency/heritage program, the local government shall justify how it reached an opposing conclusion.

5. A project applicant shall demonstrate sufficient fiscal, technical, and administrative competence to successfully execute a mitigation plan involving wetland creation.

6. Mitigation plans shall include maps, photographs, and text. The text shall:

   A. Describe the biology and/or function of the sensitive resources (e.g. wildlife/plant species or wetland) that will be affected by a proposed use. An ecological assessment of the sensitive resource to be altered or destroyed and the condition of the resource that will result after restoration will be required. Reference published protection and management guidelines.

   B. Describe the physical characteristics of the subject parcel, past, present, and future uses, and the past, present, and future potential impacts to the sensitive resources. Include the size, scope, configuration, or density of new uses being proposed within the buffer zone.

   C. Explain the techniques that will be used to protect the sensitive resources and their surrounding habitat that will not be altered or destroyed (for example, delineation of core habitat of the sensitive wildlife/plant species and key components that are essential to maintain the long-term use and integrity of the wildlife/plant area or site).

   D. Show how restoration, enhancement, and replacement (creation) measures will be applied to ensure that the proposed use results in minimum feasible impacts to sensitive resources, their buffer zones, and associated habitats.

   E. Show how the proposed restoration, enhancement, or replacement (creation) mitigation measures are NOT alternatives to avoidance. A proposed development/use must first avoid a sensitive resource, and only if this is not

possible should restoration, enhancement, or creation be considered as mitigation. In reviewing mitigation plans, the local government, appropriate state agencies, and Forest Service shall critically examine all proposals to ensure that they are indeed last resort options.

7. At a minimum, a project applicant shall provide to the local government a progress report every 3 years that documents milestones, successes, problems, and contingency actions. Photographic monitoring stations shall be established and photographs shall be used to monitor all mitigation progress.

8. A final monitoring report shall be submitted to the local government for review upon completion of the restoration, enhancement, or replacement activity. This monitoring report shall document successes, problems encountered, resource recovery, status of any sensitive wildlife/plant species and shall demonstrate the success of restoration and/or enhancement actions. The local government shall submit copies of the monitoring report to the Forest Service; who shall offer technical assistance to the local government in helping to evaluate the completion of the mitigation plan. In instances where restoration and enhancement efforts have failed, the monitoring process shall be extended until the applicant satisfies the restoration and enhancement guidelines.

9. Mitigation measures to offset impacts to resources and/or buffers shall result in no net loss of water quality, natural drainage, fish/wildlife/plant habitat, and water resources by addressing the following:

   A. Restoration and enhancement efforts shall be completed no later than one year after the sensitive resource or buffer zone has been altered or destroyed, or as soon thereafter as is practicable.

   B. All natural vegetation within the buffer zone shall be retained to the greatest extent practicable. Appropriate protection and maintenance techniques shall be applied, such as fencing, conservation buffers, livestock management, and noxious weed control. Within five years, at least 75 percent of the replacement vegetation must survive. All plantings must be with native plant species that replicate the original vegetation community.

   C. Habitat that will be affected by either temporary or permanent uses shall be rehabilitated to a natural condition. Habitat shall be replicated in composition, structure, and function, including tree, shrub and herbaceous species, snags, pool-riffle ratios, substrata, and structures, such as large woody debris and boulders.

   D. If this standard is not feasible or practical because of technical constraints, a sensitive resource of equal or greater benefit may be substituted, provided that no net loss of sensitive resource functions occurs and provided the local

government, in consultation with the appropriate State and Federal agency, determine that such substitution is justified.

E. Sensitive plants that will be destroyed shall be transplanted or replaced, to the maximum extent practicable. Replacement is used here to mean the establishment of a particular plant species in areas of suitable habitat not affected by new uses. Replacement may be accomplished by seeds, cuttings, or other appropriate methods.

Replacement shall occur as close to the original plant site as practicable. The project applicant shall ensure that at least 75 percent of the replacement plants survive 3 years after the date they are planted

F. Nonstructural controls and natural processes shall be used to the greatest extent practicable.

(1) Bridges, roads, pipeline and utility corridors, and other water crossings shall be minimized and should serve multiple purposes and properties.

(2) Stream channels shall not be placed in culverts unless absolutely necessary for property access. Bridges are preferred for water crossings to reduce disruption to hydrologic and biologic functions. Culverts shall only be permitted if there are no practicable alternatives as demonstrated by the ‘Practicable Alternative Test’.

(3) Fish passage shall be protected from obstruction.

(4) Restoration of fish passage should occur wherever possible.

(5) Show location and nature of temporary and permanent control measures that shall be applied to minimize erosion and sedimentation when riparian areas are disturbed, including slope netting, berms and ditches, tree protection, sediment barriers, infiltration systems, and culverts.

(6) Groundwater and surface water quality will not be degraded by the proposed use. Natural hydrologic conditions shall be maintained, restored, or enhanced in such a manner that replicates natural conditions, including current patterns (circulation, velocity, volume, and normal water fluctuation), natural stream channel and shoreline dimensions and materials, including slope, depth, width, length, cross-sectional profile, and gradient.

(7) Those portions of a proposed use that are not water-dependent or that have a practicable alternative will be located outside of stream, pond, and lake buffer zones.

(8) Streambank and shoreline stability shall be maintained or restored with natural vegetation.

(9) The size of restored, enhanced, and replacement (creation) wetlands shall equal or exceed the following ratios. The first number specifies the required acreage of replacement wetlands, and the second number specifies the acreage of wetlands altered or destroyed.

Restoration: 2: l
Creation: 3: l
Enhancement: 4: l

G. Wetland creation mitigation shall be deemed complete when the wetland is self-functioning for 5 consecutive years. Self-functioning is defined by the expected function of the wetland as written in the mitigation plan. The monitoring report shall be submitted to the local government to ensure compliance. The Forest Service, in consultation with appropriate state agencies, shall extend technical assistance to the local government to help evaluate such reports and any subsequent activities associated with compliance.

H. Wetland restoration/enhancement can be mitigated successfully by donating appropriate funds to a non-profit wetland conservancy or land trust with explicit instructions that those funds are to be used specifically to purchase protection easements or fee title protection of appropriate wetlands acreage in or adjacent to the Columbia River Gorge meeting the ratios given above in Guideline 9.F.(9). These transactions shall be explained in detail in the Mitigation Plan and shall be fully monitored and documented in the monitoring report.

Table 2

Types of Wildlife Areas and Sites Inventoried in the Columbia Gorge

Areas	Sites
Bald eagle habitat	Golden eagle
Deer and elk winter range	Great blue heron
Elk habitat	Larch Mountain salamander
Mountain goat habitat	Northern spotted owl
Peregrine falcon habitat	Osprey
Pika colony area	Peregrine falcon
Pileated woodpecker habitat	Purple martin
Pine marten habitat	Western pond turtle
Shallow water fish habitat (Columbia River)	
Special streams	
Special habitat area	
Spotted owl habitat	
Sturgeon spawning area	
Tributary fish habitat	
Turkey habitat	
Waterfowl area	
Western pond turtle habitat	

Table 3

Columbia Gorge and Vicinity
Endemic Plant Species

Common Name	Scientific Name
Howell's bentgrass	*Agrostis howellii*
Northern wormwood	*Artemisia campestris* var. *wormskioldii*
Hood River milk-vetch	*Astragalus hoodianus*
Howell's reedgrass	*Calamagrostis howellii*
Smooth-leaf douglasia	*Douglasia laevigata* var. *laevigata*
Howell's daisy	*Erigeron howellii*
Columbia Gorge daisy	*Erigeron oreganus*
Long-beard hawkweed	*Hieracium longiberbe*
Smooth desert parsley	*Lomatium laevigatum*
Suksdorf's desert parsley	*Lomatium suksdorfii*
Columbia Gorge broad-leaf lupine	*Lupinus latifolius* var. *thompsonianus*
Barrett's penstemon	*Penstemon barrettiae*
Pacific bluegrass	*Poa gracillima* var. *multnomae*
Obscure buttercup	*Ranunculus reconditus*
Oregon sullivantia	*Sullivantia oregana*
Columbia kittentails	*Synthyris stellata*

Table 4

Natural Areas

Area	Acres	Vegetation/Terrain
Oregon:		
Angels Rest**	350	Excellent example of basalt cliffs in west end of Gorge; rare plants
Bridal Veil Creek**	320	High-quality, low-elevation riparian forest community
Celilo Ridge*	35	Basalt cliffs and tables with east-end vegetation; rare plants
Chenoweth Table*	300	Mound/swale topography, grassland with bitterbrush, vernal ponds
Columbia Oaks*	420	Oak savanna, native grasses, old-growth fir/pine; rare plants
Crates Point+	340	Grassland, pine-oak savanna, coniferous forest
Elowah Falls**	160	Habitats ranging from Douglas-fir forests to waterfall spray zones; rare plants
Forest Service Waterfalls**	320	Wetlands and waterfall spray zones with Douglas-fir forest and rare plants
Former Mouth of Sandy River**	500	Islands, shorelines and sand/silt bars containing largest population of *Rorippa columbiae*, a rare plant
Hood River Mountain*	240	Meadow with showy wildflowers; pine/oak woodland
Horsetail Creek Wetlands**	790	Wetlands and lowland deciduous forest communities
Kaser Ridge Dunes*	310	Largest sand dune in Gorge; rare plants
Memaloose State Park+	200	Riparian habitat; plateau and cliffs with rare plants
McCord Creek Meadows**	800	Full spectrum of wet meadow plant communities
Mosier Ponds**	40	Several seasonal ponds, wetlands
Multnomah Basin**	5,600	Wetlands, extensive old-growth communities, meadows, rock garden communities
Rooster Rock**	570	Wetlands and shorelines with rare marsh plant community and riparian forest
Rowena Plateau+	1,700	Grassland, vernal ponds, oak woodland
Ruckel Creek**	650	High gradient watershed with mix of west-end and east-end forest communities
Squally Point+	50	Remnant sand dune with diverse plants, native grasses
Starvation Creek State Park**	12	Some of largest waterfalls in eastern half of Gorge; rare plants
Tanner Creek**	1,000	Old-growth forest; rare plants
Warren Creek**	115	Waterfall spray zones, riparian areas, Douglas-fir / Oregon oak woodland, grassy meadow
Waterfalls State Parks**	80	Waterfall spray zones with associated plant communities; rare plants

Table 4 (cont'd)

Natural Areas

Area	Acres	Vegetation/Terrain
Washington:		
Beacon Rock State Park**	35	Douglas-fir/red alder forest with open areas; rare plants
Burdoin Mountain**	60	Old-growth Douglas-fir with scattered ponderosa pine
Cape Horn**	55	Topographic bench, basalt cliffs and slopes; rare plants
Columbia Falls**	765	Basalt cliffs, valleys and ridges with 120-175 foot waterfalls; old-growth Douglas-fir, grand fir, and red cedar; rare plants
Columbia Hills*	2,600	Ridge with moist draws, bunch grass prairies, scablands; rare plants
Columbia Tunnels*	15	High-quality oak woodland with native grasses
Dog Mountain**	2,700	East-west transition; fir and hemlock, oak, and ponderosa pine forests, with talus slopes and grasslands
East Fork of Major Creek**	640	Intact, original forest in eastern Gorge; Douglas-fir, ponderosa pine, grand fir, scattered old-growth trees
Hamilton Creek**	1,280	Old-growth patches of Douglas-fir and riparian communities
Horsethief Ponds*	280	Mound/swale topography with ponds; rare plants
Little Wind River**	1,150	Drainage basin, including riparian areas and steep slopes; Douglas-fir and western hemlock forest with old-growth stands and rare plants
Lower Klickitat River Canyon*	145	Oak woodland with native grasses; rare plants
Lower Major & Catherine Creeks**	3,000	Oregon white oak/ponderosa pine forests, with grassland and riparian areas; rare plants
Miller Island**	130	Sand dunes and basalt cliffs; rare plants
Mosley Lakes*	110	Wetlands
Pierce Island**	200	One of the least-disturbed Columbia River islands; cottonwood-Oregon ash and shoreline plant communities; rare plants
Prindle Mountain**	130	Douglas-fir forests, meadows; rare plants
Table Mountain/Greenleaf Basin**	2,300	Bluffs, meadows, wetlands, old-growth forest; rare plants
Underwood Mountain*	120	Douglas-fir forest with rare plants
West Fork of Sasquatch Creek**	430	Remnant old-growth stand of Douglas-fir; rare plants
Wind Mountain**	290	Intact, original Douglas-fir and Oregon white oak forests

* Natural areas in General Management Area (GMA)
** Natural areas in Special Management Area (SMA)
\+ Natural areas that include land in GMA and SMA

Source: Washington Natural Heritage Program and Oregon Natural Heritage Database. *Identification of Representative Plant Communities and Botanically Significant Sites in the Columbia River Gorge National Scenic Area.* Washington Department of Natural Resources, Washington Natural Heritage Program; Oregon State Land Board, Oregon Natural Heritage Data Base, The Nature Conservancy, 1989.

CHAPTER

4

Recreation Resources

The Columbia River Gorge has provided a multitude of outdoor recreation opportunities for residents of the Northwest for many decades. Its magnificent panoramas, waterfalls, and rock formations have awed sightseers in large numbers since the construction of the Historic Columbia River Highway during and after World War I. Excellent opportunities for fishing, hiking and other outdoor activities abound. The recreation identity of the Gorge has expanded to include windsurfing, kite sailing, rafting and mountain biking.

SCENIC AREA ACT PROVISIONS

The importance of recreation to the Gorge is reflected in a number of mandates and provisions of the Scenic Area Act. Included in the first purpose of the Act is a directive to protect and enhance the recreation resources of the Columbia River Gorge [Section 3(1)]. The Gorge Commission is further directed to assess recreation resources and opportunities for enhancement of these resources, as part of the inventory process. Section 6(a)(3) of the Act calls for completion of a "recreation assessment," which specifically directs the Gorge Commission to identify areas suitable for public use facilities and, subject to the treaty and other rights of Indian tribes, designate areas to provide increased access to the Columbia River and its tributaries for recreation purposes. In addition to the recreation assessment, the Commission is directed to "protect and enhance open spaces" [Section 6(d)(3)], which include "potential and existing recreation resources" and "Federal and State wild, scenic and recreation waterways" [Section 2(l)].

Several other important provisions of the Scenic Area Act highlight the unique role of recreation in the Scenic Area. Section 6(d)(3) specifies that the Gorge Commission and Forest Service may allow the conversion of forest or agricultural land to recreation development. Recreation is the only type of new development for which such conversions are allowed. The Act further encourages new recreation development by authorizing the expenditure of $10 million for construction of recreation facilities. An additional $2.8 million is authorized for restoring and reconstructing the Historic Columbia River Highway for public recreational use.

KEY ISSUES

Perhaps more than any other part of the Scenic Area Act, the recreation mandates pose a number of unique and

formidable challenges. Many of these challenges relate to the directive that the Gorge Commission and Forest Service increase recreational access to the Columbia River and its tributaries. Because of construction of federal highway and dam projects and the presence of railroads on both shores of the river, a very limited number of potentially usable areas for recreational river access exist. Many of these remnants of the once-extensive Columbia River floodplain include sensitive natural resources. Providing facilities in these few locations is made more difficult and costly by physical barriers to the river, such as the freeway or railroad tracks. In addition, many of the remaining, potentially usable lowlands contain or are expected to contain cultural resources, which are also to be protected under the Act. Given the long history of human settlement in the Gorge, particularly focused along the river, the presence of remains of past cultures is to be expected.

A related issue involves potential conflicts between Native American fishing activities and river-oriented recreation, particularly windsurfing. The explosive growth of windsurfing, particularly in the central Gorge, has resulted in intensive usage of particular stretches of the river and substantial pressures for new access points and expansion of existing sites. The Act requires that tribal treaty rights not be affected by the provisions of the Act or Management Plan. In this situation, treaty rights protect Native American fishing activities above the Bonneville Dam (in the areas of highest windsurfing usage). Various Native Americans have objected to windsurfing activity close to fishing nets.

The rise of windsurfing presents several other challenges and issues. A number of sites receiving intensive use have not been planned or designed with adequate facilities, resulting in concerns about public safety, sanitation, and other conditions. Also, some sites may be experiencing damage to sensitive resources because of overuse.

This problem is not unique to windsurfing; there are a number of sites in the western Gorge (such as Multnomah Falls) that receive too much use related to sightseeing, hiking, and related activities. Similar problems occur at key fishing access points during peak fishing periods. Because of recent substantial increases in recreational day-use activities, certain portions of the Gorge are experiencing a severe shortage of overnight camping sites and a resulting proliferation of overnight camping in unauthorized areas. Solutions to these problems include dispersing use by providing similar opportunities in less-used portions of the Gorge, providing better information about other existing facilities that are not overused, improving site management, and providing needed camping areas near popular day-use sites.

In addressing these challenges and meeting mandates to increase river-related recreation, the Gorge Commission and Forest Service must also protect the rural character of Gorge landscapes. It is crucial that the provision of new facilities for resource-based recreation does not degrade the very resources and scenic settings that attract recreationists to the

Scenic Area. Another important concern is maintaining the quality of life for the many residents of the Scenic Area, while meeting the Act's recreation mandates.

OVERVIEW OF RECREATION RESOURCES PROVISIONS

The Management Plan provides the following:

- Overall recreation goals, objectives, and policies (this chapter).
- Recreation intensity classes, with specific guidelines and criteria addressing new public and commercial recreation development (this chapter).
- Public and Commercial Recreation land use designations (Part II, Chapter 6).
- A recreation development plan that provides the policy framework for implementing high-priority proposed public recreation facilities (Part III, Chapter 1).
- The Recreation Development Proposals list, adopted separately from the Management Plan, highlights selected sites and proposed projects at those sites that, when implemented, will best achieve the recreation goals and objectives of the Scenic Area Act.

These various elements reflect the recreation assessment mandates specified in Section 6 of the Act.

The goals, objectives, policies, and guidelines of this chapter provide a framework for guiding the actions of the various public and private recreation providers in the Scenic Area, as well as those agencies whose programs either affect or are affected by recreation uses. Such entities include local, state, and federal planning and park agencies, as well as private and nonprofit groups.

This chapter is divided into the following sections:

<u>GMA Provisions: Overall Goals, Objectives and Policies</u>

- Protection of Resources
- Scenic Appreciation and Scenic Travel Corridors
- Resource-Based Recreation
- River Access and Protection of Treaty Rights
- Interpretation/Education
- Trails and Pathways
- Transportation
- Coordination

<u>GMA Provisions: Recreation Intensity Classes</u>

<u>SMA Provisions: Overall Goal, Policies and Guidelines</u>

<u>SMA Provisions: Recreation Intensity Classes</u>

GMA PROVISIONS: OVERALL GOALS, OBJECTIVES, AND POLICIES

PROTECTION OF RESOURCES

GMA Goals

1. Protect and enhance recreation resources consistent with Indian treaty rights.

2. Protect scenic, natural, cultural, and recreation resources when providing new recreation opportunities.

GMA Objectives

1. Encourage recreation facility designs that blend the facilities with their natural settings, especially designs that restore and/or enhance natural, cultural, or scenic resource values of a site.

2. Encourage innovative approaches to siting, design, and construction of recreation facilities that minimize their environmental impacts.

GMA Policies

1. Recreation resources shall be protected from adverse effects from new development on adjacent lands by establishing buffers between recreation uses and new buildings on adjacent lands. Guidelines implementing this policy are contained in “Review Uses” (Part II, Chapter 7: General Policies and Guidelines).

2. The goals, objectives, policies, guidelines and all other provisions of this plan shall not affect legally existing uses at recreation sites that existed as of the date the Gorge Commission adopted this plan (October 15, 1991).

3. All proposed recreation uses shall comply with guidelines for protection of scenic, natural, cultural, and recreation resources.

4. Private concessions and other commercial uses at public recreation sites shall be allowed pursuant to adopted policies of the public park agency owning the site. If a different agency manages the site, that agency's policies shall apply, unless superseded by provisions of the owning agency's policies.

5. For commercial recreation sites and public recreation sites not owned or managed by a public park agency with adopted concession policies, the following policies shall apply:

A. Retail sales at campgrounds shall be limited to camping supplies for overnight guests in dedicated space within the registration or central office building.

B. Private concessions in permanent structures shall be limited to one structure per park site. Sales shall be limited to those items necessary for enjoyment and use of recreation opportunities at the site, including food and beverages and recreation equipment rental.

C. Mobile vendors may be permitted, subject to local government approvals. Local government review shall address solid waste disposal, visual impacts of signage, traffic circulation, and safety. Such uses shall be limited to the term of the recreation season, and sales shall be limited to food and beverages and recreation equipment rental.

SCENIC APPRECIATION AND SCENIC TRAVEL CORRIDORS

GMA Goals

1. Increase scenic appreciation opportunities throughout the Scenic Area.

2. Designate those portions of the following roads in the Scenic Area as scenic travel corridors and promote uses that improve their functions as recreational and scenic travel routes: Historic Columbia River Highway (all segments); Washington State Routes 14, 141, and 142; Oregon Highway 35; and Interstate 84.

GMA Objectives

1. Provide new viewpoints that highlight the outstanding scenic vistas of the Gorge, the river itself, and special scenic features.

2. Encourage recreation facilities that improve the visual quality of previously disturbed sites.

3. Emphasize recreation facility designs that provide and maintain views of the Columbia River and Gorge walls.

4. Establish new viewpoints of the Columbia River and Gorge landscapes at places offering outstanding views along designated scenic travel corridors.

5. Create or restore openings in vegetation along the Historic Columbia River Highway, Washington State Route 14, and Interstate 84 to provide or improve views of the Columbia River and Gorge walls in a manner consistent with guidelines to protect natural, cultural, scenic, and recreation resources. Specific guidelines for such proposals are contained in Guideline 4 of the "Scenic Travel Corridors" section in Part I, Chapter 1: Scenic Resources.

6. Establish walking and bicycling paths along segments of the Historic Columbia River Highway either abandoned or currently closed to regular vehicular traffic. Give high priority to restoring and reconnecting these segments to create a continuous bicycle/pedestrian pathway through the Scenic Area.

7. Provide safe pedestrian and bicycle passage across the three Columbia River bridges in the Scenic Area to connect scenic travel corridors for these user groups.

8. Establish low-elevation bicycle paths or lanes along or near Interstate 84 and Washington State Route 14 through the Scenic Area. Abandoned segments of the Historic Columbia River Highway may fulfill this objective in certain locations. Explore establishing bicycle paths or lanes or otherwise improving bicycle safety for drivable portions of the Historic Columbia River Highway.

GMA Policies

1. Planning and management efforts for recreational uses within scenic travel corridors, such as viewpoints, pedestrian and bicycle paths, shall involve potentially affected landowners, relevant recreation agencies and organizations, fire, law enforcement and emergency service providers, Indian tribal governments, and affected local agencies as an integral component of such efforts.

2. Potential funding sources shall be evaluated as an integral component of all recreation facility planning efforts within scenic travel corridors. Fiscal impacts to local public service providers shall be considered as part of this process.

3. Provision of pedestrian and bicycle paths within scenic travel corridors shall include barrier-free opportunities.

RESOURCE-BASED RECREATION

GMA Goal

Provide a diversity of resource-based recreation opportunities that are accessible to all segments of the public and that emphasize the quality of the recreation experience.

GMA Objectives

1. Increase resource-based recreation opportunities for the physically challenged, less affluent, and other underrepresented segments of the public.

2. Provide additional overnight camping opportunities in natural settings, especially near popular day-use areas.

3. Protect existing popular recreation sites from overuse by providing opportunities and facilities at new locations with similar recreation attributes.

4. Emphasize provision of resource-based recreation opportunities in portions of the Scenic Area relatively lacking in such opportunities, particularly the eastern end and the Washington side.

GMA Policies

1. The Scenic Area recreation program shall emphasize provision of resource-based, outdoor recreation opportunities. Resource-based recreation includes those recreation uses that are essentially dependent upon the natural, scenic, or cultural resources of the Scenic Area and that do not adversely affect those resources upon which they depend. Such uses include, but are not limited to, trail use, fishing, boating, swimming, windsurfing, wildlife viewing, sightseeing, picnicking, camping, and visiting interpretive facilities. Recreation uses that are not resource-based (such as playgrounds and community parks) and not part of a resource-based recreation use are addressed in Part II, Chapter 6: Recreation Designations.

2. Recreation intensity classes (described in more detail later in this chapter) shall be applied to all lands under the Gorge Commission's jurisdiction. These classes identify areas potentially suitable for varying intensities of new resource-based recreation uses.

3. Non-resource-based recreation facilities included in proposed resource-based recreation sites shall be allowed if the site is predominantly dedicated to resource-based recreation.

4. The Recreation Development Proposals List identifies proposed public recreation facilities that are the highest priority for implementation. These proposed facilities focus on providing resource-based recreation opportunities. Public funding for facilities proposed in that list shall be limited to resource-based uses and necessary support facilities.

5. Recreation demand shall be an important consideration in providing new facilities and opportunities, but shall not supersede consideration of the quality of recreation experience provided or protection of other resources.

RIVER ACCESS AND PROTECTION OF TREATY RIGHTS

GMA Goal

Increase recreational access to the Columbia River and its tributaries, subject to the treaty and other rights of Indian tribes. Increase access in a manner that maximizes preservation of the shoreline area and minimizes impacts to sensitive resources.

GMA Objectives

1. Increase opportunities for river-oriented, day-use recreation (such as boating, fishing, windsurfing, and swimming) along the shoreline of the Columbia River and its tributaries.

2. Encourage recreation facilities that provide for compatible multiple uses at riverfront recreation sites.

3. Encourage recreation facility designs that consolidate access to river-oriented recreation opportunities, and that place non-water-dependent facilities away from the immediate shoreline area as much as possible.

GMA Policies

1. Emphasis shall be given to river-oriented, day-use recreation along the shoreline of the Columbia River and its tributaries (such as boat launches or swim beaches). Recreation uses that are not water-dependent or water-related (such as overnight camping) shall be sited to preserve opportunities for water-dependent and water-related uses near the shore.

2. In providing additional river access, the establishment of new facilities shall be balanced with stretches of river shore emphasizing low-intensity recreation and minimal facilities. The result should be a generally natural-appearing shoreline punctuated by nodes of concentrated recreation activities and facilities.

3. Potentially affected tribal and local governments shall be consulted at the onset of all planning efforts for public-use recreation facilities in the GMA.

4. For proposed new riverfront recreation facilities above Bonneville Dam, the applicant shall assess the potential effects of the recreation proposal on treaty fishing activities, and shall prepare a management plan that addresses any potential effects that are determined to exist. The requirements of such plans are specified in the recreation intensity class guidelines. Project approval shall be contingent upon demonstration that any effects to treaty fishing activities have been removed through redesign and/or application of mitigation measures. Tribal consultation on such plans shall be required.

5. Temporary closures of river-oriented recreation sites during critical treaty fishing periods shall be considered where existing adverse effects on treaty fishing have been demonstrated.

6. Where proposed or designated in-lieu Indian fishing sites are near potential river recreation sites, cooperative planning and cost-sharing agreements to fund access development shall be explored.

7. The Gorge Commission shall work with local and state law enforcement, public safety, and emergency services agencies to develop coordinated and comprehensive strategies addressing public safety and law enforcement needs associated with existing and increased recreational river access. Such strategies shall consider the personnel and fiscal impacts of increased service demands and shall identify needed funding for such impacts and demands.

8. Recreation providers shall consult with applicable local and state law enforcement, public safety, and emergency service providers when developing proposals for new recreational river access. Law enforcement and safety concerns associated with existing recreation river access shall be considered when developing strategies in response to new river access proposals.

INTERPRETATION/EDUCATION

GMA Goal

Increase public understanding and appreciation of the human and natural resources of the Scenic Area, both past and present, through interpretive/educational programs and facilities.

GMA Objectives

1. Increase awareness and appreciation of the great diversity of natural, cultural, scenic, and recreation resources of the Scenic Area.

2. Increase awareness and appreciation of the interrelationships between human activities and the Gorge environment.

3. Provide a full spectrum of barrier-free (physical, linguistic, cultural, sensory) interpretive opportunities.

4. Encourage the establishment of "gateway" facilities located at major entryways to the Scenic Area. Such facilities should:

   A. Welcome and orient the visitor and provide tourist information.

   B. Offer exhibits on the features and resources in the vicinity of the facility.

   C. Encourage visitors to visit the Gorge Discovery Center near The Dalles and provide programs complementary to that facility.

   D. Encourage visitors to visit the Skamania Lodge Conference Center in Stevenson.

GMA Policies

1. When planning new interpretive programs and/or facilities, relevant recommendations of the *Interpretive Strategy for the Columbia River Gorge National Scenic Area* shall be considered. (This document is available at the Gorge Commission office in White Salmon, Washington, and the Forest Service office in Hood River, Oregon.)

2. Programs and measures to protect sensitive cultural and/or natural resources shall be required as a part of any effort to interpret such resources. Tribal consultation shall be required, and tribal comments shall be considered, for any efforts involving interpretation of Native American prehistory, history, or culture.

3. Information about Scenic Area recreation opportunities shall be disseminated at important recreation/visitor information facilities, including the Gorge Discovery Center, Skamania Lodge Conference Center, information kiosks, and gateway facilities.

TRAILS AND PATHWAYS

GMA Goal

Provide a diversity of new trail opportunities in a variety of settings that highlight the special resources of the Gorge, while adequately maintaining and, where appropriate, upgrading existing trails.

GMA Objectives

1. The following three objectives are the highest priorities for future designated public-use trails in the GMA:

   A. Provide trails linking Urban Areas and the Portland/Vancouver metropolitan area to recreation opportunities in the Scenic Area.

   B. Establish a trail system (or series of trails) along the Columbia River.

   C. Increase trail opportunities on the Washington side of the Scenic Area and in the eastern portions of the Scenic Area.

2. Other trail objectives are:

   A. Promote the Columbia River as a scenic waterway trail and support dispersed boat moorages and other low-intensity boating facilities to implement this objective.

   B. Establish a loop trail around the Scenic Area.

   C. Establish trails along the major tributaries of the Columbia River.

D. Provide trail linkages between Scenic Area trail opportunities and trails in the National Forests and other public lands north and south of the Scenic Area.

E. Provide safe bikeways for recreational use on appropriate county roads when consistent with county plans and programs.

GMA Policies

1. Trail planning and management efforts shall include affected landowners, relevant agencies, Indian tribal governments, and trail organizations from the beginning of such efforts.

2. The Gorge Commission shall not acquire property or easements for trails without property owner consent. The Gorge Commission shall encourage other public bodies to acquire property or easements for trails through purchase or donation.

3. As an integral component of trail planning, development, and management efforts, strategies shall be developed to address trespass, noxious weeds, and public safety issues (such as fire hazard, emergency rescue, and classification systems for degree of trail difficulty). Such efforts shall include consultation with fire, law enforcement, and emergency service providers.

4. Temporary trail closures during critical fire hazard periods should be considered.

5. Shared use of trails by compatible multiple-user groups should be encouraged as much as possible where appropriate conditions exist, to maximize efficient use of trails and reduce needs for new trail construction.

6. User conflicts on trails shall be minimized through proper siting, design, and maintenance and an aggressive user education program. Multiple-use trails shall be built to standards sufficient to accommodate such different groups. Standards shall address safety concerns and considerations such as signage, trail width, visibility, and percent grade.

7. Use of motorized vehicles on designated public use trails shall be prohibited, except for use by response agencies and their agents in an emergency.

8. Priority shall be given to the completion and improvement of existing trails, incomplete trail loops, and trail segments, considering relationships with trails in Urban Areas, the SMA, and outside the Scenic Area.

9. Use levels on existing trails and projected demand for different trail uses shall be considered when planning additional trails.

10. Trail systems and new trails shall, where feasible, incorporate existing segments of older/historic trails and abandoned road and railroad rights-of-way.

11. The use of utility corridor rights-of-way for trail use shall be explored where such use would not interfere with the corridors' primary functions.

12. Barrier-free access shall be provided for new trails and improvements to existing trails to the maximum extent practicable.

13. Public needs for convenience, access, and security shall be considered when designing and siting trailheads.

14. Where appropriate and practicable, facilities shall be provided at trailheads to promote alternatives to the private automobile for accessing trail opportunities.

15. Potential funding sources shall be evaluated as an integral component of all trail planning efforts. Fiscal impacts to local public service providers shall be considered as part of this process, including adequacy of funding to provide for proper maintenance, emergency response, and law enforcement functions.

16. Trails proposed along the Columbia River and its tributaries shall be designed in a manner that minimizes effects to the shoreline and associated habitat values. Seasonal closures during critical wildlife periods shall be considered, as well as other appropriate mitigative measures.

TRANSPORTATION

GMA Goals

1. Provide transportation facilities that meet the needs of the traveling public and implement this plan's recreation goals and objectives while protecting scenic, natural, cultural, and recreation resources.

2. Promote alternative modes of transportation to improve safety and enjoyment of the traveling public and to help alleviate future traffic demand.

GMA Objectives

1. Encourage the provision of alternate modes of transportation to recreation destinations to reduce resource impacts and facilitate visitation by all segments of the public. Such alternate modes include, but are not limited to, shuttles, railroad, bicycles, and boat access.

2. Encourage tour boat and tour train access to important recreation facilities (such as the Gorge Discovery Center) as mass transportation alternatives that offer both access to such sites and recreational experiences in themselves.

3. Improve linkages between different modes of transportation at major recreation sites in the Scenic Area.

4. Improve access to recreation opportunities in the Scenic Area for the physically-challenged, less affluent and other underrepresented user groups.

GMA Policies

1. Accommodation of facilities for mass transportation (bus turnarounds, etc.) shall be required for all new high-intensity (Recreation Intensity Class 4) day-use recreation sites, except for sites predominantly devoted to boat access. These facilities are also encouraged for all new moderate-intensity (Recreation Intensity Class 3) day-use recreation sites where practicable.

2. All transportation facilities or improvements associated with public recreation shall be designed to minimize impacts to scenic, natural, cultural, and recreation resources to the maximum extent practicable.

COORDINATION

GMA Goal

Develop an outdoor recreation program that coordinates plans and actions of all relevant recreation providers and planning agencies to meet the recreation needs of Scenic Area residents and visitors. Such coordination shall seek to avoid land use conflicts and duplication of services.

GMA Objectives

1. Encourage new recreation facilities that complement other existing or planned recreation facilities in an area and/or provide linkages between such facilities.

2. Encourage coordinated, comprehensive recreation planning on a non-jurisdictional basis for distinct subareas of the Gorge possessing similar characteristics.

3. Encourage comprehensive recreation planning that fosters a unified, regional approach and deemphasizes divisions by state, county, or other jurisdictional boundaries, while recognizing the particular needs of such jurisdictions.

GMA Policies

1. Coordinated, regional approaches to solving ongoing operational and management problems (such as emergency response, law enforcement, and coordinated fee/permit systems) shall be pursued in planning new recreation uses and for comprehensive plan updates and revisions, to the maximum extent practicable. Such efforts shall include exploring additional revenue sources to defray the costs of law enforcement and public safety services provided by local government service providers.

2. Existing or proposed recreation facilities or areas outside the Scenic Area and inside Urban Areas that may affect recreation use and/or demand in the Scenic Area shall be considered when evaluating recreation proposals.

3. Proposed recreation developments shall be evaluated for consistency with existing county, city, port, or other relevant plans.

GMA PROVISIONS: RECREATION INTENSITY CLASSES

Recreation intensity classes have been applied to all GMA lands on which the Gorge Commission has planning jurisdiction. They are an overlay to the underlying land use designations (see Part II) and reflect potential suitability of GMA lands for varying degrees of resource-based recreation facilities open for public use. Recreation intensity classes do not supersede any provisions of underlying land use designations, nor do they affect recreation uses existing as of the date the Gorge Commission adopted the Management Plan (October 15, 1991).

The recreation intensity class map divides the Scenic Area into four classes, indicating suitable levels of recreation use and facility development, ranging from very low-intensity to high-intensity.

GMA Goal

Identify suitable levels of resource-based, public-use facilities to meet the Management Plan recreation goals and objectives while protecting scenic, natural, and cultural resources.

GMA Policies

1. Proposed resource-based recreation facilities or uses shall be consistent with applicable recreation intensity class guidelines and the "Approval Criteria for Recreation Uses" contained in this chapter. Resource-based recreation includes those recreation uses that are essentially dependent upon the natural, scenic, or cultural resources of the Scenic Area and that do not adversely affect those resources upon which they depend. Such uses include but are not limited to trail use, fishing, boating, swimming, windsurfing, wildlife viewing, sightseeing, picnicking, camping, and visiting interpretive facilities.

2. Recreation uses that are not resource-based in nature are not subject to the guidelines and criteria of the recreation intensity classes. Such recreation uses may be permitted pursuant to provisions of the land use designations, and include community parks and playgrounds, tennis courts, swimming pools, and playing fields for organized team sports. New golf courses shall not be permitted. Existing golf courses may be expanded, subject to conditions.

3. In addition to the guidelines and criteria contained in this section, proposed resource-based recreation uses shall comply with all applicable guidelines to protect natural, cultural, and scenic resources.

4. Land slope, road access, the presence of geologic or other hazards, and the presence of significant or sensitive resources shall be primary considerations in determining the suitability of lands for recreation. Other considerations shall include the presence of site amenities providing recreation opportunities and proximity to complementary recreation facilities.

5. High-intensity recreation uses shall be limited to the most suitable lands for recreational access to the Columbia River and its major tributaries and suitable lands for recreation use near designated Urban Areas or Rural Centers.

6. Recreation shall be limited to very low-intensity uses in inventoried wetlands, special habitat areas, significant natural areas, steeply sloping lands, and geologic hazard areas.

7. Recreation shall be limited to very low-intensity uses in areas of existing orchards, vineyards, row crops or other high-value agricultural uses on lands designated Large-Scale or Small-Scale Agriculture.

8. Recreation shall be limited to low-intensity recreation uses in areas with the most suitable soils for cultivation on lands designated Large-Scale or Small-Scale Agriculture.

9. Notwithstanding Policies 7 and 8 of this section, moderate- or high-intensity recreation uses may be allowed on lands adjacent to the Columbia River or its major tributaries offering significant opportunities for recreational river access.

10. Low- and moderate-intensity recreation uses shall be emphasized on lands designated Commercial Forest Land or Large or Small Woodland most suitable for such uses.

11. Recreation shall be limited to low-intensity uses on lands designated Residential.

12. Proposed changes to the recreation intensity class of an area shall require a plan amendment subject to Gorge Commission approval.

13. Proposed developments in an area classified Recreation Intensity Class 4 (high intensity) that exceed the guidelines for that class shall require county approval, upon satisfaction of Guideline 2 in "Variances and Plan Amendments" in the recreation intensity class guidelines.

14. The recreation intensity class guidelines shall be applied to individual recreation facilities. (Individual recreation facilities are defined in "Facility Design Guidelines for All Recreation Projects," below.)

15. The Gorge Commission shall evaluate the results of the recreation intensity classes in 5 years, as part of the Management Plan update and review process. This evaluation shall include an assessment of the cumulative effects of new recreation development on scenic, cultural, natural, and recreation resources of the Scenic Area and in the vicinity of the development. The Commission may at any time reevaluate the recreation intensity classes in the vicinity of a new Recreation Intensity Class 3 or 4 development for possible cumulative effects.

GMA Guidelines

Allowable Uses

The following uses are allowable, subject to compliance with the "Approval Criteria for Recreation Uses" and "Facility Design Guidelines For All Recreation Projects" in this section.

1. Recreation Intensity Class 1 (Very Low Intensity)

    A. Parking areas for a maximum of 10 cars for any allowed uses in Recreation Intensity Class 1.

    B. Trails for hiking, equestrian, and mountain biking use.

    C. Pathways for pedestrian and bicycling use.

    D. Trailheads (with provisions for hitching rails and equestrian trailers at trailheads accommodating equestrian use).

    E. Scenic viewpoints and overlooks.

    F. Wildlife/botanical viewing and nature study areas.

    G. River access areas.

    H. Simple interpretive signs and/or displays, not to exceed a total of 50 square feet.

    I. Entry name signs, not to exceed 10 square feet per sign.

    J. Boat docks, piers, or wharfs.

    K. Picnic areas.

L. Restrooms/comfort facilities.

2. Recreation Intensity Class 2 (Low Intensity)

A. All uses permitted in Recreation Intensity Class 1.

B. Parking areas for a maximum of 25 cars, to serve any allowed uses in Recreation Intensity Class 2. Parking spaces for campground units are to be included in this number.

C. Simple interpretive signs and displays, not to exceed a total of 100 square feet.

D. Entry name signs, not to exceed 20 square feet per sign.

E. Boat ramps, not to exceed two lanes.

F. Campgrounds for 20 units or less, tent sites only.

3. Recreation Intensity Class 3 (Moderate Intensity)

A. All uses permitted in Recreation Intensity Classes 1 and 2.

B. Parking areas for a maximum of 75 cars, to serve any allowed uses in Recreation Intensity Class 3. Parking spaces for campground units are to be included in this number.

C. Interpretive signs, displays and/or facilities.

D. Visitor information and environmental education signs, displays, or facilities.

E. Entry name signs, not to exceed 32 square feet per sign.

F. Boat ramps, not to exceed three lanes.

G. Concessions stands, pursuant to applicable policies in this chapter.

H. Campgrounds for 50 individual units or less, for tents and/or recreational vehicles, with a total density of no more than 10 units per acre (density to be measured based on total size of recreation facility and may include required buffer and setback areas). Class 3 campgrounds may also include one group campsite area, in addition to the allowed individual campground units or parking area maximums.

4. Recreation Intensity Class 4 (High Intensity)

A. All uses permitted in Recreation Intensity Classes 1, 2, and 3.

B. Parking areas for a maximum of 250 cars, to serve any allowed uses in Recreation Intensity Class 4. Parking spaces for campground units are to be included in this number.

C. Horseback riding stables and associated facilities.

D. Entry name signs, not to exceed 40 square feet per sign.

E. Boat ramps.

F. Campgrounds for 175 individual units or less, for tents and/or recreational vehicles, with a total density of no more than 10 units per acre (density to be measured based on total size of recreation facility and may include required buffer and setback areas). Class 4 campgrounds may also include up to three group campsite areas, in addition to allowed individual campsite units or parking area maximums.

Approval Criteria for Recreation Uses

1. For all proposed recreation projects outside of Public or Commercial Recreation designations, project applicants shall demonstrate compliance with the following criteria (if applicable) as a condition of project approval:

   A. Compliance with all applicable guidelines in this Management Plan for the protection of scenic, cultural, recreation, and natural resources. Cumulative effects of proposed recreation projects on landscape settings shall be based on the "Compatible Recreation Use Guideline" for the landscape setting in which the proposed project is located (see Part I, Chapter 1: Scenic Resources).

   B. For proposed recreation projects in or adjacent to lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland, compliance with the following:

      (1) The use would not seriously interfere with accepted forest or agricultural practices on surrounding lands devoted to forest or farm uses. Provision of onsite buffers may be used to partially or fully comply with this criterion, depending upon project design and/or site conditions.

      (2) A declaration has been signed by the project applicant or owner and recorded with county deeds and records specifying that the applicant or owner is aware that operators are entitled to carry on accepted forest or farm practices on lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland.

   C. For proposed projects including facilities for outdoor fires for cooking or other purposes, or for proposed campgrounds, compliance with the following:

(1) The project applicant shall demonstrate that a sufficient quantity of water necessary for fire suppression (as determined pursuant to applicable fire codes or the county fire marshall) is readily available to the proposed facility, either through connection to a community water system or onsite wells, storage tanks, sumps, ponds or similar storage devices. If connection to a community water system is proposed, the project applicant shall demonstrate that the water system has adequate capacity to meet the facility's emergency fire suppression needs without adversely affecting the remainder of the water system with respect to fire suppression capabilities.

(2) To provide access for firefighting equipment, access drives shall be constructed to a minimum of 12 feet in width and a maximum grade of 12 percent. Access drives shall be maintained to a level that is passable to firefighting equipment.

D. For proposed trail or trailhead projects, compliance with applicable trails policies in the Management Plan.

E. For proposed projects providing boating or windsurfing access to the Columbia River or its tributaries, compliance with applicable "River Access and Protection of Treaty Rights" objectives in this chapter.

F. For proposed projects on public lands or proposed projects providing access to the Columbia River or its tributaries, compliance with guidelines for protection of tribal treaty rights in Part IV, Chapter 3: Indian Treaty Rights and Consultation.

G. For proposed projects that include interpretation of natural or cultural resources, demonstration that the interpretive facilities will not adversely affect natural or cultural resources and that appropriate and necessary resource protection measures shall be employed.

H. For proposed Recreation Intensity Class 4 projects (except for projects predominantly devoted to boat access), demonstration that the project accommodates provision of mass transportation access to the site. The number and size of the mass transportation facilities shall reflect the physical capacity of the site. This requirement may be waived upon a demonstration that providing such facilities would result in overuse of the site, either degrading the quality of the recreation experience or adversely affecting other resources at the site.

Facility Design Guidelines for All Recreation Projects

1. Recreation facilities that are not resource-based in nature may be included at sites providing resource-based recreation uses consistent with the guidelines and criteria in this chapter, as long as such facilities comprise no more than one-third of the

total land area dedicated to recreation uses and/or facilities. Required landscaped buffers may be included in calculations of total land area dedicated to recreation uses and/or facilities.

2. The facility design guidelines are intended to apply to individual recreation facilities. For the purposes of these guidelines, a cluster or grouping of recreational developments or improvements located relatively close to one another is considered an individual recreation facility.

   Developments or improvements within the same recreation intensity class are considered as separate facilities if they are separated by at least 1/4 mile of undeveloped land (excluding trails, pathways, or access roads).

3. Parking areas, access roads, and campsites shall be sited and designed to fit into the existing natural contours as much as possible, both to minimize ground-disturbing grading activities and to use topography to screen parking areas and associated structures. Parking areas, access roads, and campsites shall be sited and set back sufficiently from bluffs so they are visually subordinate as seen from key viewing areas.

4. Existing vegetation, particularly mature trees, shall be maintained to the maximum extent practicable, and used to screen parking areas and campsites from key viewing areas and satisfy requirements for perimeter and interior landscaped buffers.

5. Parking areas providing over 50 spaces shall be divided into discrete "islands" separated by unpaved, landscaped buffer areas.

6. Lineal frontage of parking areas and campsite loops on scenic travel corridors shall be minimized.

7. Ingress/egress points shall be consolidated to the maximum extent practicable, providing for adequate emergency access pursuant to applicable fire and safety codes.

8. Signage shall be limited to that necessary to provide relevant recreation or facility information, interpretive information, vehicular and pedestrian direction, and for safety purposes.

9. Exterior lighting shall be shielded, designed, and sited in a manner that prevents such lighting from projecting offsite or being highly visible from key viewing areas.

10. Innovative designs and materials that reduce visual impacts (such as "turf blocks" instead of conventional asphalt paving) shall be encouraged through incentives such as additional allowable parking spaces and reduced required minimum interior or perimeter landscaped buffers. If the county determines that potential visual

impacts have been substantially reduced by use of such designs and materials, it may allow either a) reductions of up to 50 percent of required minimum interior or perimeter landscape buffers, or b) up to 10 percent additional parking spaces.

11. A majority of trees, shrubs, and other plants in landscaped areas shall be species native or naturalized to the landscape setting in which they occur. The landscape setting design guidelines in Part I, Chapter 1 specify appropriate species.

12. All structures shall be designed so that height, exterior colors, reflectivity, mass, and siting enable them to blend with and not noticeably contrast with their setting.

13. Landscape buffers around the perimeter of parking areas accommodating more than 10 vehicles shall be provided. Minimum required widths are 5 feet for 20 vehicles or fewer, 20 feet for 50 vehicles or fewer, 30 feet for 100 vehicles or fewer, and 40 feet for 250 vehicles or fewer.

14. Interior landscaped buffers breaking up continuous areas of parking shall be provided for any parking areas with over 50 spaces. The minimum width of interior landscaped buffers separating each subarea of 50 spaces or less shall be 20 feet.

15. Within required perimeter and interior landscaped buffer areas, a minimum of one tree of at least 6 feet in height shall be planted for every 10 lineal feet as averaged for the entire perimeter width. A minimum of 25 percent of planted species in perimeter buffers shall be coniferous to provide screening during the winter. Project applicants are encouraged to place such trees in random groupings approximating natural conditions. In addition to the required trees, landscaping shall include appropriate shrubs, groundcover, and other plant materials.

16. Minimum required perimeter landscaped buffer widths for parking areas or campgrounds may be reduced by as much as 50 percent, at the discretion of the county, if existing vegetation stands and/or existing topography are used such that the development is not visible from any key viewing area.

17. Grading or soil compaction within the "drip line" of existing mature trees shall be avoided to the maximum extent practicable, to reduce risk of root damage and associated tree mortality.

18. All parking areas and campsites shall be set back from scenic travel corridors and the Columbia River and its major tributaries by at least 100 feet. Required perimeter landscaped buffers may be included when calculating such setbacks. Setbacks from rivers shall be measured from the ordinary high water mark. Setbacks from scenic travel corridors shall be measured from the edge of road pavements.

19. Project applicants shall use measures and equipment necessary for the proper maintenance and survival of all vegetation used to meet landscape standards, and shall be responsible for such maintenance and survival.

20. All parking areas shall be set back from property boundaries by at least 50 feet. All campsites and associated facilities shall be set back from property boundaries by at least 100 feet.

21. All proposed projects that are larger than those allowed in Recreation Intensity Classes 1-3, and are on lands classified Recreation Intensity Class 4 (except for proposals predominantly devoted to boat access) shall comply with Guideline H in "Approval Criteria for Recreation Uses" in this chapter regarding provision of mass transportation access.

Variances and Plan Amendments

1. A local government may grant a variance to the setback and buffer requirements contained in this chapter upon a finding that all of the following conditions exist:

    A. The proposed project is a public-use, resource-based recreation facility providing or supporting either recreational access to the Columbia River and its tributaries, or recreational opportunities associated with a scenic travel corridor.

    B. All reasonable measures to redesign the proposed project to comply with required setbacks and buffers have been explored, and application of those setbacks and buffers would prohibit a viable recreation use of the site as proposed.

    C. Resource impacts have been mitigated to less than adverse levels through design provisions and mitigation measures.

    D. The variance is the minimum necessary to accommodate the use.

2. A local government may grant a variance of up to 10 percent to the guidelines of Recreation Intensity Class 4 for parking and campground units upon demonstration that all of the following conditions exist:

    A. Demand and use levels for the proposed activity(s), particularly in the area where the site is proposed, are high and expected to remain so and/or increase. Statewide Comprehensive Outdoor Recreation Plan (SCORP) data and data from Scenic Area recreation demand studies shall be relied upon to meet this criterion in the absence of current applicable studies.

    B. The proposed use is dependent on resources present at the site.

    C. Reasonable alternative sites offering similar opportunities, including those in nearby Urban Areas, have been evaluated, and it has been demonstrated that the proposed use cannot be adequately accommodated elsewhere.

    D. The proposed use is consistent with the goals, objectives, and policies in this chapter.

E. Through site design and/or mitigation measures, the proposed use can be implemented without adversely affecting scenic, natural, or cultural resources and adjacent land uses.

F. Through site design and/or mitigation measures, the proposed use can be implemented without affecting treaty rights.

3. Proposals to change the recreation intensity class of an area shall require a Management Plan amendment, pursuant to policies 1 through 4 in "Amendment of the Management Plan" (Part IV, Chapter 1: Gorge Commission Role).

SMA PROVISIONS: OVERALL GOALS, POLICIES, AND GUIDELINES

SMA Goal

Protect and enhance recreation resources.

SMA Policies

1. Recreation Opportunity Spectrum settings (see glossary) shall be protected and enhanced.

2. All new developments and land uses shall protect recreation resources.

3. Recreation resources shall be protected by limiting development and uses, as designated in the recreation intensity class guidelines.

4. Recreation opportunities shall encourage and facilitate use by all sectors of the public, including ethnic groups, persons with disabilities, the elderly, and the young.

5. Only natural resource-based recreation shall be allowed.

6. Comprehensive recreation resource planning shall be encouraged to foster a unified, regional approach and de-emphasize jurisdictional divisions.

7. Proposed changes to the recreation intensity class of an area shall require a Management Plan amendment, subject to Gorge Commission approval and concurrence by the Forest Service.

8. Proposals in an area of Recreation Intensity Class 4 that exceed the guidelines for that class shall require county approval upon satisfaction of the exceptions criteria specified in the recreation intensity class guidelines.

9. When planning new interpretive or education programs and/or facilities, recommendations of the *Interpretive Strategy for the Columbia River Gorge National Scenic Area* shall be followed. (This document is available at the Gorge Commission office in White Salmon and the Forest Service office in Hood River.)

10. Alternate modes of transportation to destination recreation facilities are encouraged, including use of shuttles, waterway facilities, and rail travel, to facilitate visitation and reduce impacts to scenic, cultural, natural, and recreation resources.

SMA Guidelines

1. New developments and land uses shall not displace existing recreational use.

2. Recreation resources shall be protected from adverse effects by evaluating new developments and land uses as proposed in the site plan. An analysis of both onsite and offsite cumulative effects shall be required.

3. New pedestrian or equestrian trails shall not have motorized uses, except for emergency services.

4. Mitigation measures shall be provided to preclude adverse effects on the recreation resource.

5. The facility guidelines are intended to apply to individual recreation facilities. For the purposes of these guidelines, a cluster or grouping of recreational developments or improvements located relatively close to one another is considered an individual recreation facility. Developments or improvements within the same recreation intensity class are considered as separate facilities if they are separated by at least 1/4 mile of undeveloped land (excluding trails, pathways, or access roads).

6. New development and reconstruction of scenic routes (see Part III, Chapter 1: Recreation Development Plan) shall include provisions for bicycle lanes.

7. A local government may grant a variance of up to 10 percent to the guidelines of Recreation Intensity Class 4 for parking and campground units upon demonstration that all of the following conditions exist:

    A. Demand and use levels for the proposed activity(s), particularly in the area where the site is proposed, are high and expected to remain so and/or increase. Statewide Comprehensive Outdoor Recreation Plan (SCORP) data and data from National Scenic Area recreation demand studies shall be relied upon to meet the criterion in the absence of current applicable studies.

    B. The proposed use is dependent on resources present at the site.

    C. Reasonable alternative sites offering similar opportunities, including those in Urban Areas, have been evaluated, and it has been demonstrated that the proposed use cannot be adequately accommodated elsewhere.

    D. The proposed use is consistent with the goals, objectives, and policies in this chapter.

E. Through site design and/or mitigation measures, the proposed use can be implemented without adversely affecting scenic, natural, or cultural resources and adjacent land uses.

F. Through site design and/or mitigation measures, the proposed use can be implemented without affecting treaty rights.

G. Mass transportation shall be considered and implemented, if feasible, for all proposed variances to Recreation Intensity Class 4.

8. Proposals to change the recreation intensity class of an area shall require a Management Plan amendment pursuant to policies 1 through 4 in "Amendment of the Management Plan" (Part IV, Chapter 1: Gorge Commission Role).

9. The recreation intensity classes are designed to protect recreation resources by limiting land development and land uses.

SMA PROVISIONS: RECREATION INTENSITY CLASSES

SMA Guidelines

1. Recreation Intensity Class 1 (Very Low Intensity)

The emphasis is to provide opportunities for semi-primitive recreation.

A. Permitted uses are those in which people participate in outdoor activities to realize experiences such as solitude, tension reduction, and nature appreciation.

B. The maximum site design capacity shall not exceed 35 people at one time on the site. The maximum design capacity for parking areas shall be 10 vehicles.

C. The following uses may be permitted:

(1) Trails and trailheads.

(2) Parking areas.

(3) Dispersed campsites accessible only by a trail.

(4) Viewpoints and overlooks.

(5) Picnic areas.

(6) Signs.

(7) Interpretive exhibits and displays.

(8) Restrooms.

2. Recreation Intensity Class 2 (Low Intensity)

The emphasis is to provide opportunities for semi-primitive recreation.

A. Permitted uses are those that provide settings where people can participate in activities such as physical fitness, outdoor learning, relaxation, and escape from noise and crowds.

B. The maximum site design capacity shall not exceed 70 people at one time on the site. The maximum design capacity for parking areas shall be 25 vehicles.

C. All uses permitted in Recreation Intensity Class 1 are permitted in Recreation Intensity Class 2. The following uses may also be permitted:

(1) Campgrounds for twenty (20) units or less, tent sites only. *(Revised: U.S. Sec.Ag. concurrence 7/1/11)*

(2) Boat anchorages designed for no more than 10 boats at one time.

(3) Swimming areas.

3. Recreation Intensity Class 3 (Moderate Intensity)

The emphasis is on facilities with design themes emphasizing the natural qualities of the area. Developments are complementary to the natural landscape, yet can accommodate moderate numbers of people.

A. Permitted uses are those in which people can participate in activities to realize experiences such as group socialization, nature appreciation, relaxation, cultural learning, and physical activity.

B. The maximum site design capacity shall not exceed 250 people at one time on the site. The maximum design capacity for parking areas shall be 50 vehicles. The GMA vehicle capacity level of 75 vehicles shall be allowed if enhancement or mitigation measures for scenic, cultural, or natural resources are approved for at least 10 percent of the site.

C. Accommodation of facilities for mass transportation (bus parking, etc.) shall be required for all new Recreation Intensity Class 3 day-use recreation sites, except for sites predominantly devoted to boat access.

D. All uses permitted in Recreation Intensity Classes 1 and 2 are permitted in Recreation Intensity Class 3. The following uses may also be permitted:

(1) Campgrounds with improvements that may include vehicle access, water, power, sewer, and sewage dump stations. *(Revised: U.S. Sec. Ag. concurrence 7/1/11)*

(2) Boat anchorages designed for not more than 15 boats.

(3) Public visitor, interpretive, historic, and environmental education facilities.

(4) Full-service restrooms that may include showers.

(5) Boat ramps.

(6) Riding stables.

4. Recreation Intensity Class 4 (High Intensity)

The emphasis is on providing roaded natural, rural, and suburban recreation opportunities with a high level of social interaction.

A. Permitted uses are those in which people can participate in activities to realize experiences such as socialization, cultural and natural history appreciation, and physical activity.

B. The maximum design capacity shall not exceed 1,000 people at one time on the site. The maximum design capacity for parking areas shall be 200 vehicles. The GMA vehicle capacity level of 250 vehicles shall be allowed if enhancement or mitigation measures for scenic, cultural, or natural resources are approved for at least 20 percent of the site.

C. Accommodation of facilities for mass transportation (bus parking, etc.) shall be required for all new Recreation Intensity Class 4 day-use recreation sites, except for sites predominantly devoted to boat access.

D. All uses permitted in Recreation Intensity Classes 1, 2, and 3 are permitted in Recreation Intensity Class 4.

CHAPTER

1

Agricultural Land

Agriculture in the Columbia River Gorge is varied and is distributed throughout the Scenic Area. It ranges from row crops, hay, and specialty crops in the western Gorge to orchards and vineyards in the central Gorge to wheat and rangeland in the east. It includes intensive practices involving irrigation and extensive operations involving the grazing of grasslands. Agriculture and its associated support industries (packing and processing, farm equipment, etc.) have historically been a vital part of the local economy, particularly in the central and eastern Gorge, and remain so today.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act directs the Gorge Commission and the Forest Service to "protect and enhance agricultural lands for agricultural uses and to allow, but not require, conversion of agricultural lands to open space, recreation development or forest lands" [Section 6(d)(1)].

The Act defines agricultural lands to be those lands "used or suitable for the production of crops, fruits or other agricultural products, or the sustenance of livestock . . ." [Section 6(b)(2)].

KEY ISSUES

Agricultural lands are often the most easily developed lands for non-resource uses, such as residential and commercial. In the United States in recent decades, farmland has been converted to non-farm uses at a rate of 3 million acres per year.

In the Scenic Area, pressure to convert resource land is especially evident in the western and central parts of the Gorge. In the western Gorge, urban and suburban growth in the Portland/ Vancouver metropolitan area is putting pressure on eastern Multnomah County in the Corbett area and on eastern Clark County and western Skamania County. In the central Gorge, growth associated with sailboarding and recreation homesites is impacting agricultural lands in the Underwood, Hood River, Lyle, and Mosier areas.

Agricultural lands need to be protected for agricultural practices. Farm practices such as spraying herbicides and pesticides, noise from farm machinery, and odors can be unpleasant to nearby residents and others. Conversely, non-farm residences and other uses can introduce plants that are hosts to pests and virus into agricultural areas, and can introduce dogs and other pets that may harass farm animals.

The division of agricultural lands into parcels too small to be used in commercial operations promotes the fragmentation of otherwise viable farms. In turn, these parcels provide opportunities for non-farm dwellings and other uses to locate among agricultural lands. Besides the conflicts these uses may present to nearby farms, the parcels are often no longer used or made available for commercial farm use.

OVERVIEW OF AGRICULTURAL LAND PROVISIONS

This chapter is divided into three sections. A section addressing policies and guidelines for lands designated Agriculture in the GMA is followed by a section for lands designated Agriculture-Special in the GMA. The third section includes policies and guidelines for one Agriculture designation in the SMA.

The GMA Agriculture policies provide for two designations: Large-Scale and Small-Scale. These policies assure the protection of commercial agricultural lands, while recognizing existing areas where small-scale, part-time farms exist. Small-scale lands are those blocks of land that are suitable for part-time agriculture or an agricultural use too small to support workers or provide significant products for market or processors. These lands are not able to be consolidated with large-scale agricultural operations.

The GMA Agriculture policies also establish minimum parcel sizes that protect agricultural land from conversion to non-resource uses and are large enough to ensure efficient agricultural management. Land divisions in the SMA are not permitted by the Scenic Area Act.

Both the GMA and SMA provisions establish use policies and guidelines that protect agricultural land from conflicting uses and conversion. These provisions establish uses that may be allowed and the guidelines to be used to determine consistency with plan policies. GMA guidelines also establish buffers to be used to protect lands designated Agriculture from conflicting uses on adjacent lands.

Agriculture-Special lands are natural areas where there may be existing livestock grazing. The GMA policies for these lands prohibit cultivation to protect sensitive plant communities. And Agriculture-Special policies and guidelines encourage landowners to consider voluntary natural protection programs to protect native rangeland.

GMA PROVISIONS

LARGE-SCALE AND SMALL-SCALE AGRICULTURE

GMA Goal

Protect and enhance agricultural land for agricultural uses. Agricultural lands are those lands that are used for or suitable for agricultural use.

GMA Objectives

1. Enhance agriculture in areas designated Large-Scale Agriculture by encouraging the consolidation of small, inefficient parcels into larger, more efficient ownerships.

2. Support programs that provide tax incentives for continued agricultural use and enhance the competitive capabilities of farms and ranches, thereby encouraging the long-term enhancement, preservation, and expansion of agricultural lands. Support programs that encourage agricultural practices that preserve other natural resources.

GMA Policies

Designation Policies

1. Those lands that are currently being used to produce crops, fruits, or other agricultural products or for the sustenance of livestock shall be designated as Large-Scale or Small-Scale Agriculture.

2. Those lands that are classified as predominantly Class I through Class IV soils or are designated unique farmland by the U.S. Department of Agriculture Soil Conservation Service or local conservation district shall be designated as Large-Scale or Small-Scale Agriculture.

3. Those lands that are suitable for producing forage for livestock, including seasonal rangeland and areas used for calving, shall be designated as Large-Scale or Small-Scale Agriculture.

4. Those lands that are interspersed among lands suitable or used for agriculture shall be designated as Large-Scale or Small-Scale Agriculture in order to protect agricultural lands from conflicting uses.

5. Those lands that are suitable for both agriculture and forestry shall be designated as Large-Scale or Small-Scale Agriculture if the surrounding area is generally devoted to agriculture.

6. Blocks of land that have been committed by development to other uses shall not be deemed used for or suitable for agriculture.

7. The diversity of agricultural operations in the Scenic Area shall be recognized by distinguishing between Large-Scale and Small-Scale Agriculture.

    A. Blocks of agricultural land shall be designated as Large-Scale Agriculture if they:

(1) Are currently devoted to agriculture of a scale that is land intensive, employs workers, or provides significant products for markets or processors, or

(2) Have a combination of soil capability, size, and freedom from conflicting use that renders them suitable for large-scale agriculture or farm forestry.

B. Blocks of agricultural land shall be designated as Small-Scale Agriculture if they:

(1) Have little potential for consolidation with large-scale agricultural lands and are currently devoted to agriculture of a scale too small to support workers or provide a significant volume of products for markets or processors, and

(2) Have a combination of soil capability and size that provides an opportunity for direct marketing or part-time/second-income agriculture.

C. Small blocks of land that may by themselves be deemed Small-Scale Agriculture shall be designated as Large-Scale Agriculture if residential development of them would conflict with the resource use of adjacent lands designated Large-Scale Agriculture or Commercial Forest Land. Small blocks that are adjacent to Urban Areas, Residential, or Small Woodland land use designations or that are physically buffered by natural or manmade barriers from adjacent Large-Scale Agriculture and Commercial Forest Land designations may be considered for a Small-Scale Agriculture designation.

Land Use Policies

1. Conversion of agricultural land to forest land or open space shall be allowed.

2. Conversion of land from agriculture use to recreation shall be allowed when consistent with the guidelines established for the recreation intensity classes (Part I, Chapter 4: Recreation Resources) and the Recreation Development Plan (Part III, Chapter 1).

3. Agricultural land shall be protected from conflicts by limiting the number, size, proximity, and scale of conflicting uses on nearby lands.

4. Agricultural land shall be protected from conversion to residential land by establishing minimum lot sizes for the creation of new parcels that are adequate to maintain existing agricultural operations, and by specifying the uses that may occur and the conditions of approval.

5. Minimum lot sizes shall be established that are adequate to maintain agricultural operations and that:

   A. Recognize the diversity of type and scale of farms and ranches in the Scenic Area.

   B. Are large enough to ensure efficient agricultural management and to discourage speculative real estate investment.

   C. Take into account the common field size for crops or livestock, adjacent uses, parcel sizes in the area, common size or economic unit for farms and ranches in the area, the existing landscape setting, wildlife habitat, scenic sensitivity, and other factors.

6. The following minimum parcel sizes shall be established for the creation of new parcels:

   A. Large-Scale Agriculture

      (1) A 40-acre minimum shall be applied to those areas designated Large-Scale Agriculture that are predominantly used for intensive farm operations, including the production of row crops, berries, vineyards, irrigated orchard land, and nursery stock. Farm/forestry operations are common in these areas.

      (2) A 60-acre minimum shall be applied to those areas designated Large-Scale Agriculture that are predominantly used for non-irrigated orchard land. Dryland orchards require greater acreage to obtain production similar to irrigated orchards.

      (3) An 80-acre minimum shall be applied to those areas designated Large-Scale Agriculture that are predominantly used for haying and pasturing. Production of crops may also occur in the area. Farm/forestry operations are common in these areas.

      (4) A 160-acre minimum shall be applied to those areas designated Large-Scale Agriculture that are predominantly used for extensive operations, primarily livestock grazing. Livestock and wheat ranches are common in these areas.

      (5) Where a larger minimum parcel size is required by the Management Plan to protect a resource other than agricultural land, the larger minimum size shall apply.

B. Small-Scale Agriculture

(1) A minimum parcel size for lands designated Small-Scale Agriculture shall be established using the criteria prescribed in land use Policy 5, above. Except as provided for in Policy 7, below, the minimum parcel size shall not be less than 20 acres.

7. Local governments may allow creation of parcels smaller than the designated minimum parcel size in the Small-Scale Agriculture designation, and award a density bonus, in order to cluster new residences to protect scenic, cultural, natural, or recreation resources.

8. Agricultural use shall be allowed in areas designated Large-Scale or Small-Scale Agriculture.

9. Agricultural buildings shall be allowed in areas designated Large-Scale or Small-Scale Agriculture if they are shown to be accessory to agricultural use.

10. Single-family dwellings shall be allowed in areas designated Large-Scale Agriculture when:

    A. A farm dwelling is shown to be in conjunction with and substantially contributes to the effective and efficient current agricultural use of a farm or ranch, or

    B. A non-farm dwelling is shown not to convert land from agricultural use and not to interfere or conflict with agriculture on nearby lands.

11. All legally created, undeveloped parcels in a Small-Scale Agriculture designation are entitled to a single-family dwelling. Qualified agricultural labor housing may also be allowed.

12. Specified non-agricultural uses, such as buildings accessory to an existing residence, may be allowed, subject to review to minimize the loss of agricultural land and to prevent interference with agricultural uses. Non-agricultural uses that would interfere with agricultural operations shall not be allowed.

13. Agriculture shall be enhanced by allowing processing and packing of agricultural products and uses that offer direct marketing opportunities, subject to review to minimize the loss of agricultural land and to limit the size and scale of use.

GMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Large-Scale Agriculture or Small-Scale Agriculture.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Large-Scale Agriculture or Small-Scale Agriculture.

Review Uses

1. The following uses may be allowed on lands designated Large-Scale or Small-Scale Agriculture subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

    A. New cultivation, subject to compliance with guidelines for the protection of cultural resources (Part I, Chapter 2: Cultural Resources) and natural resources (Part I, Chapter 4: Natural Resources).

    B. Agricultural structures, except buildings, in conjunction with agricultural use.

    C. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

    D. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.E or Guideline 1.F below.

    E. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel less than or equal to 10 acres in size are subject to the following additional standards:

        (1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

F. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel larger than 10 acres in size are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 2,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The footprint of any individual accessory building shall not exceed 1,500 square feet.

(3) The height of any individual accessory building shall not exceed 24 feet.

G. The temporary use of a mobile home in the case of a family hardship, subject to the guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

H. On lands designated Large-Scale Agriculture, a single-family dwelling in conjunction with agricultural use, upon a demonstration that all of the following conditions exist:

(1) The subject farm or ranch (including all of its constituent parcels, contiguous or otherwise) has no other dwellings that are vacant or currently occupied by persons not directly engaged in farming or working on the subject farm or ranch and that could be used as the principal agricultural dwelling.

(2) The farm or ranch upon which the dwelling will be located is currently devoted to agricultural use, as defined under "Designation Policies," where the day-to-day activities of one or more residents of the agricultural dwelling will be principally directed to the agricultural use of the land. The farm or ranch must currently satisfy Guideline (3)(d), below.

(3) The farm or ranch is a commercial agricultural enterprise as determined by an evaluation of the following factors:

(a) Size of the entire farm or ranch, including all land in the same ownership.

(b) Type(s) of agricultural uses (crops, livestock) and acreage.

(c) Operational requirements for the particular agricultural use that are common to other agricultural operations in the area.

(d) Income capability. The farm or ranch, and all its constituent parcels, must be capable of producing at least $40,000 in gross annual income. This determination can be made using the following formula:

$$(A)(B)(C) = I$$

where:

A = Average yield of the commodity per acre or unit of production
B = Average price of the commodity
C = Total acres suitable for production, or total units of production that can be sustained, on the subject farm or ranch
I = Income capability

I. On lands designated Large-Scale Agriculture, a second single-family dwelling in conjunction with agricultural use when the dwelling would replace an existing dwelling that is included in, or eligible for inclusion in, the National Register of Historic Places, in accordance with the criteria listed in GMA Policy 10.A in Part I, Chapter 2: Cultural Resources.

J. On lands designated Small-Scale Agriculture, a single-family dwelling on any legally existing parcel.

K. On lands designated Large-Scale Agriculture, a single-family dwelling for an agricultural operator's relative provided that all of the following conditions exist:

(1) The dwelling would be occupied by a relative of the agricultural operator or of the agricultural operator's spouse who will be actively engaged in the management of the farm or ranch. Relative means grandparent, grandchild, parent, child, brother or sister.

(2) The dwelling would be located on the same parcel as the dwelling of the principal operator.

(3) The operation is a commercial enterprise, as determined by an evaluation of the factors described in Guideline 1.H(3) under "Review Uses" in this section.

L. Construction, reconstruction, or modifications of roads not in conjunction with agriculture.

M. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in

"Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

N. Structures associated with hunting and fishing operations.

O. Towers and fire stations for forest fire protection.

P. Agricultural labor housing, under the following conditions:

(1) The proposed housing is necessary and accessory to a current agricultural use.

(2) The housing shall be seasonal, unless it is shown that an additional full-time dwelling is necessary to the current agricultural use of the subject farm or ranch unit. Seasonal use shall not exceed 9 months.

(3) The housing shall be located to minimize the conversion of lands capable of production of farm crops or livestock, and shall not force a significant change in or significantly increase the cost of accepted agricultural practices employed on nearby lands devoted to agricultural use.

Q. On lands designated Large-Scale Agriculture, on a parcel that was legally created and existed prior to November 17, 1986, a single-family dwelling not in conjunction with agricultural use upon a demonstration that all of the following conditions exist:

(1) The dwelling will not force a change in or increase the cost of accepted agricultural practices on surrounding lands.

(2) The subject parcel is predominantly unsuitable for the production of farm crops and livestock, considering soils, terrain, location, and size of the parcel. Size alone shall not be used to determine whether a parcel is unsuitable for agricultural use. An analysis of suitability shall include the capability of the subject parcel to be used in conjunction with other agricultural operations in the area.

(3) The dwelling shall be set back from any abutting parcel designated Large-Scale or Small-Scale Agriculture, as required in "Agricultural Buffer Zones," below, or designated Commercial Forest Land or Large or Small Woodland, as required in "Siting of Dwellings on Forest Land" (Part II, Chapter 2: Forest Land).

(4) A declaration has been signed by the landowner and recorded into county deeds and records specifying that the owners, successors, heirs, and assigns of the subject property are aware that adjacent and nearby operators are entitled to carry on accepted agriculture or forest practices on lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, Large or Small Woodland.

(5) All owners of land in areas designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland that is within 500 feet of the perimeter of the subject parcel on which the dwelling is proposed to be located have been notified and given at least 10 days to comment prior to a decision.

R. On parcels in Small-Scale Agriculture, a land division creating parcels smaller than the designated minimum parcel size, subject to the guidelines for cluster development in "Land Divisions and Cluster Development" (Part II, Chapter 7: General Policies and Guidelines). If the designated minimum parcel size is 20 acres, this provision will apply to parcels 40 acres in size or larger. Similarly, if the designated minimum parcel size is 40, 80, or 160 acres, this provision will apply to parcels 80 acres or larger, 160 acres or larger, or 320 acres or larger, respectively.

S. Life estates, subject to the guidelines for life estates in "Approval Criteria for Life Estates," below.

T. Land divisions, subject to the guidelines for minimum parcel sizes in land use Policy 6, above.

U. Lot line adjustments that would result in the potential to create additional parcels through subsequent land divisions, subject to the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

V. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

W. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

X. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

Y. Commercial events, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

Z. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

2. The following uses may be allowed on lands designated Large-Scale or Small-Scale Agriculture, subject to compliance with the guidelines for the protection of scenic, cultural, natural, and recreation resources and the "Approval Criteria for Specified Review Uses," below.

   A. Utility facilities and railroads necessary for public service upon a showing that (1) there is no practicable alternative location with less adverse effect on agricultural or forest lands, and (2) the size is the minimum necessary to provide the service.

   B. Home occupations or cottage industries in existing residential or accessory structures, subject to the guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines).

   C. Fruit and produce stands, upon a showing that sales will be limited to agricultural products raised on the subject farm and other farms in the local region.

   D. Wineries, in conjunction with onsite viticulture, upon a showing that processing of wine is from grapes grown on the subject farm or in the local region.

   E. Wine sales/tasting rooms, in conjunction with an on-site winery.

   F. Agricultural product processing and packaging, upon a showing that the processing will be limited to products grown primarily on the subject farm and sized to the subject operation.

   G. Exploration, development, and production of mineral and geothermal resources, subject to the guidelines in Part I, Chapter 1: Scenic Resources.

   H. Personal-use airstrips, including associated accessory structures such as a hangar. A personal-use airstrip is an airstrip restricted (except for aircraft emergencies) to use by the owner; invited guests on an infrequent and occasional basis; and commercial aviation activities in connection with agricultural operations. No aircraft may be based on a personal-use airstrip other than those owned or controlled by the owner of the airstrip.

   I. Aquaculture.

   J. Recreation development, subject to the recreation intensity class provisions (Part I, Chapter 4: Recreation Resources) and Recreation Development Plan (Part III, Chapter 1).

K. Boarding of horses. The reviewing agency shall make findings on property characteristics, parcel size and impacts to neighbors, and shall specify the maximum number of horses based on those findings.

L. Temporary portable asphalt/batch plants related to public road projects, not to exceed 6 months.

M. Bed and breakfast inns in single-family dwellings, subject to the guidelines in "Bed and Breakfast Inns" (Part II, Chapter 7: General Policies and Guidelines) and provided that the residence:

(1) Is included in the National Register of Historic Places, or

(2) In Washington, is listed on the Washington State Register of Historic Places maintained by the Washington Office of Archaeology and Historic Preservation, or

(3) In Oregon, is identified and protected under local landmark status as approved pursuant to Oregon state land use regulations protecting historic structures.

N. Nonprofit, environmental learning or research facilities.

O. Expansion of existing school or place of worship.

P. On parcels designated Small-Scale Agriculture, small-scale fishing support and fish processing operations on parcels that are contiguous with and have direct access to the Columbia River, subject to the guidelines in "Small-Scale Fishing Support and Fish Processing Operations" (Part II, Chapter 7: General Policies and Guidelines).

Q. Disposal sites managed and operated by the Oregon Department of Transportation, the Washington State Department of Transportation, or a Gorge county public works department for earth materials and any intermixed vegetation generated by routine or emergency/disaster public road maintenance activities within the Scenic Area, subject to compliance with the guidelines in "Disposal Sites for Spoil Materials from Public Road Maintenance Activities" (Part II, Chapter 7: General Policies and Guidelines).

Agricultural Buffer Zones

1. All new buildings shall comply with the following guidelines when proposed to be located on a parcel adjacent to lands that are designated Large-Scale or Small-Scale Agriculture and are currently used for or are suitable for agricultural use:

SETBACK GUIDELINES

Type of Buffer (Size in Feet)

Type of Agriculture	*Open or Fenced*	*Natural or Created Vegetation Barrier*	*8-foot Berm or Terrain Barrier*
Orchards	250	100	75
Row crops/ Vegetables	300	100	75
Livestock grazing Pasture, haying	100	15	20
Grains	200	75	50
Berries, vineyards	150	50	30
Other	100	50	30

2. Earth berms may be used to satisfy, in part, the setback guidelines. The berm shall be a minimum of 8 feet in height, and contoured at 3:1 slopes to look natural. Shrubs, trees, and/or grasses shall be employed on the berm to control erosion and achieve a finished height of 15 feet.

3. The planting of a continuous vegetative screen may be used to satisfy, in part, the setback guidelines. Trees shall be at least 6 feet high when planted and reach an ultimate height of at least 15 feet. The vegetation screen shall be planted along the appropriate parcel line(s), and shall be continuous.

4. The necessary berming and/or planting shall be completed during the first phase of development and maintained in good condition.

5. If several crops or crop rotation is involved in the adjacent operation, the greater setback shall apply.

6. A local government may grant a variance to the buffer guidelines upon a demonstration that the variance guidelines in "Variances from Setbacks and Buffers" (Part II, Chapter 7: General Policies and Guidelines) have been satisfied.

Approval Criteria for Life Estates

1. A landowner who sells or otherwise transfers real property on lands designated Large-Scale or Small-Scale Agriculture may retain a life estate in a dwelling and a tract of land surrounding the dwelling. The life estate tract shall not be considered a parcel as defined in the Management Plan. A second dwelling in conjunction with agricultural use may be allowed, subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources and upon findings that:

    A. The proposed dwelling is in conjunction with agricultural use, using Guideline 1.H of "Review Uses" in this chapter.

    B. Upon termination of the life estate, the original or second dwelling shall be removed.

Approval Criteria for Specified Review Uses

1. The uses identified under Guideline 2 under "Review Uses," above, may be allowed only if they meet both of the following criteria:

    A. The use is compatible with agricultural uses and would not force a change in or significantly increase the cost of accepted agricultural practices on nearby lands devoted to agricultural use.

    B. The use will be sited to minimize the loss of land suitable for the production of crops or livestock.

AGRICULTURE-SPECIAL

GMA Goals

1. Ensure that new uses do not adversely affect natural areas that are potentially eligible for the Oregon Register of Natural Heritage Resources or the Washington Register of Natural Areas Program.

2. Encourage landowners to enhance those portions of natural areas that are in fair or poor condition.

GMA Objectives

1. Inform landowners and agency officials about voluntary natural area protection programs that are conducted by state agencies and nonprofit organizations, such as the Oregon Natural Heritage Program, the Washington Natural Heritage Program, and The Nature Conservancy.

2. Assist owners of natural areas who wish to realize benefits from programs that promote long-term protection of open space values by informing them of opportunities such as property tax relief through special assessment programs, income tax benefits through charitable donations, or acquisition by government agencies or nonprofit organizations.

GMA Policies

1. Natural areas that are potentially eligible for the Oregon Register of Natural Heritage Resources or the Washington Register of Natural Areas Program shall be designated as Open Space or Agriculture-Special.

2. Potentially eligible natural areas that are primarily rangeland and substantially contribute to existing livestock operations shall be designated Agriculture--Special if continued livestock grazing would not adversely affect native plant communities or rare plants.

   The Oregon and Washington Natural Heritage Programs have concluded that continued livestock grazing is compatible with the following natural areas: Celilo Ridge and Crates Point, Oregon, and Columbia Hills and Horsethief Ponds, Washington. These natural areas are designated Agriculture-Special.

3. Potentially eligible natural areas that would be adversely affected by intensive uses shall be designated as Open Space. The following natural areas are designated Open Space: Chenoweth Table, Columbia Oaks, Rowena Plateau, and Squally Point, Oregon; and Columbia Tunnels, Lower Klickitat River Canyon, and Mosley Lakes, Washington.

4. The Gorge Commission, in consultation with the Oregon and Washington Natural Heritage Programs, have prepared guidelines that specify what uses may be allowed in each natural area. Uses that would adversely affect native plant communities and rare plants shall be prohibited in natural areas. Guidelines for natural areas designated Agriculture-Special are presented in this section, below. Guidelines for natural areas designated Open Space are found in Part II, Chapter 4: Open Space.

5. Landowners and agency officials shall be encouraged to rehabilitate those portions of natural areas that have been degraded and invaded by non-native plant species and weeds. Rehabilitation may be accomplished through a variety of means, including soil and water conservation planning, weed control, and livestock management.

GMA Guidelines

Uses Allowed Outright for Lands Designated Agriculture-Special

1. The following uses may be allowed on lands designated Agriculture-Special without review:

    A. Existing livestock grazing. A livestock operation ceases to be existing when the land on which it is conducted has lain idle for more than 5 years.

    B. Repair, maintenance, and operation of existing and serviceable structures, trails, roads, railroads, and utility facilities.

    C. Low-intensity recreation uses that occur with the knowledge and permission of the landowner, including hunting, fishing, trapping, native plant study, birdwatching, photography, horseback riding, and hiking.

    D. Temporary livestock facilities, such as portable livestock pens and corrals.

    E. New fences that exclude livestock from lands that are not part of an existing livestock operation.

Uses Allowed through the Expedited Review Process

1. The uses listed in “Expedited Development Review Process” (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Agriculture-Special.

Review Uses for Lands Designated Agriculture-Special

1. The following uses may be allowed on lands designated Agriculture-Special, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and "Approval Criteria for Review Uses on Lands Designated Agriculture-Special" in this section.

    A. New livestock grazing. Any operation that would introduce livestock to land that has not been grazed, or has laid idle, for more than 5 years shall be considered new livestock grazing.

    B. New fences, livestock watering facilities, and corrals.

    C. Soil, water, and vegetation conservation uses.

    D. Replacement or minor expansion of existing and serviceable structures within a dedicated site. Expansion shall be limited to the dedicated site.

E. Fish and wildlife management uses, educational activities, and scientific research.

F. Land divisions that facilitate livestock grazing or protect and enhance natural areas. No resulting parcel may be smaller than 160 acres, unless it would facilitate the protection of scenic, cultural, natural, or recreation resources.

G. Single-family dwellings that are not in conjunction with agricultural use, if a landowner demonstrates that (1) the dwelling cannot be constructed on a portion of the parcel that is located outside of the natural area, and (2) the dwelling is sited and designed in a manner that minimizes adverse effects to the natural area. All dwellings shall meet the criteria in Guideline 1.Q of "Review Uses" (Part II, Chapter 1: Agricultural Land). The buffer guidelines for non-agricultural dwellings may be waived if they would prevent the optimum siting of a dwelling.

H. Recreation uses, subject to the provisions for recreation intensity classes (in Part I, Chapter 4: Recreation Resources).

I. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

J. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

K. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

L. Lot line adjustments, subject to the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

Approval Criteria for Review Uses on Lands Designated Agriculture-Special

1. A range conservation plan shall be prepared before new livestock grazing commences; new fences, livestock watering facilities, and corrals are constructed; or soil, water, and vegetation conservation activities are undertaken (review uses 1.A, 1.B, and 1.C). Range conservation plans are described under "Range Conservation Plans" below.

2. The local government shall submit all land use applications and range conservation plans to the Oregon or Washington Natural Heritage Program. The

state heritage program will have 20 days from the date that an application and/or plan is mailed to submit written comments to the local government.

The local government shall record and address any written comments submitted by the state heritage program in its development review order.

3. Based on the comments from the state heritage program, the local government shall make a final decision on whether the proposed use is consistent with the Agriculture-Special policies and guidelines. If the final decision contradicts the comments submitted by the state heritage program, the local government shall justify how it reached an opposing conclusion.

Uses Prohibited on Lands Designated Agriculture-Special

1. Except for uses allowed outright and review uses, new uses shall be prohibited on lands designated Agriculture-Special. Prohibited uses include, but are not limited to:

    A. Cultivation, including plowing, harrowing, leveling, tilling, or any activity that prepares land for raising crops by turning, breaking up, or loosening the soil.

    B. Removal or clearing of native grasses, shrubs, and trees.

    C. Single-family dwellings and accessory structures, other than non-agricultural dwellings allowed as a review use.

    D. Barns, silos, and other agricultural buildings.

    E. Irrigation systems.

    F. Exploration, development, and production of mineral resources.

    G. Utility facilities, public use facilities, and roads.

Range Conservation Plans

1. If a range conservation plan is required before a use is allowed, it shall be prepared by landowners in cooperation with range scientists from local conservation districts. Specialists from the Oregon or Washington Natural Heritage Program should be consulted while the plan is being prepared.

2. Range conservation plans shall ensure that new uses do not adversely affect natural areas. They shall accomplish the following goals:

    A. Maintain native rangeland that is in excellent or good condition; enhance rangeland that is in fair or poor condition.

B. Preserve native trees and shrubs.

C. Reestablish native grasses in degraded areas that have been invaded by non-native plants and weeds.

3. Range conservation plans shall include the following elements:

A. Range inventory. This shall include existing composition, carrying capacity, and condition of rangeland; the location of rare plants and non-native weeds; and existing fences, watering ponds, and other range improvements.

B. Rehabilitation plan. This shall include actions that will be taken to rehabilitate native rangeland that is in fair or poor condition, such as weed and soil erosion control, seeding, and prescribed burning.

C. Livestock management plan. This shall include the grazing system that will be used, including number and size of pastures, expected livestock numbers, and grazing/deferral periods and sequence. Management plans shall project livestock movements for at least 3 years.

D. Monitoring program. This shall track the annual progress of the conservation plan and condition of the range. Monitoring techniques shall be described, such as line transects or photographic plots.

SMA PROVISIONS

SMA Goal

Protect and enhance lands that are used or suitable for agricultural uses.

SMA Policies

1. Only lands determined to be used or suitable for agricultural purposes may be designated Agriculture.

2. Lands that are classified as predominantly Class I through Class IV soils, or are designated unique farmlands by the U.S. Department of Agriculture Soil Conservation Service or local conservation district, or are suitable for producing forage for livestock, are considered suitable for designation as Agriculture.

3. Other lands that are interspersed among lands used or suitable for agricultural purposes may be designated Agriculture in order to protect agricultural lands from conflicting uses.

4. Use of agricultural land for forest, open space, or public recreation is allowed and shall comply with the appropriate land use designation policies and guidelines. Use of agricultural land for commercial recreation is allowed and shall comply with the provisions of Part I, Chapter 4: Recreation Resources.

5. Conversion of lands designated Agriculture to Forest Land or to Open Space is allowed.

6. Agricultural lands shall be protected by minimizing adjacent land use conflicts.

7. Existing and new programs that promote farm practices that conserve and enhance natural resources shall be encouraged and facilitated.

8. The use of agricultural lands for public recreation or commercial recreation shall be allowed when consistent with the provisions of Part I, Chapter 4: Recreation Resources.

9. New dwellings shall not be permitted on parcels of land of less than 40 contiguous acres.

10. Structures, new dwellings, and agricultural buildings shall maintain the visual character of the landscape setting.

11. New dwellings and agricultural buildings shall only be allowed in areas designated Agriculture if they are shown to be necessary for and accessory to agricultural use.

12. Scenic, cultural, natural, and recreation resource guidelines shall be applied to new land uses and developments.

13. All National Forest System lands shall be subject to the laws and regulations pertaining to National Forest lands, including the National Environmental Policy Act (NEPA), and the Mt. Hood National Forest Land and Resource Management Plan, and the Gifford Pinchot National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan. The most protective standards of the National Scenic Area Management Plan or the respective Forest Land and Resource Management Plans (as amended by the Northwest Forest Plan) shall apply to National Forest System lands.

SMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Agriculture.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Agriculture.

Review Uses

1. The following uses may be allowed on lands designated Agriculture subject to review for compliance with the scenic, cultural, natural, and recreation resource guidelines. The use or development shall be sited to minimize the loss of land suitable for the production of agricultural crops or livestock.

    A. New cultivation or new agricultural use outside of previously disturbed and regularly worked fields or areas. Clearing trees for new agricultural use is subject to the additional requirements of 1.W of Part II, Chapter 2: Forest Land.

    B. Forest uses and practices, as allowed for in Part II, Chapter 2: Forest Land.

    C. A single-family dwelling necessary for and accessory to agricultural use upon a demonstration that all of the following conditions exist:

        (1) The proposed dwelling would be the only dwelling on the subject farm or ranch, including contiguous lots/parcels.

(2) The farm or ranch upon which the dwelling will be located is currently devoted to agricultural use, where the day-to-day activities of one or more residents of the dwelling will be principally directed to the agricultural use of the land. The farm or ranch must currently satisfy Guideline (3)(d), below.

(3) The farm or ranch is a commercial agricultural enterprise as determined by an evaluation of the following criteria:

(a) Size of the entire farm or ranch, including all land in the same ownership.

(b) Type(s) of agricultural uses (crops, livestock, orchard, etc.) and acreage.

(c) Operational requirements for the particular agricultural use that are common to other agricultural operations in the area.

(d) Income capability. The farm or ranch, and all its contiguous parcels, must be capable of producing at least $40,000 in gross annual income. This determination can be made using the following formula, with periodic adjustments for inflation:

$$(A)(B)(C) = I$$

where:

A = Average yield of the commodity per acre or unit of production
B = Average price of the commodity
C = Total acres suitable for production, or total units of production that can be sustained, on the subject farm or ranch
I = Income capability

(4) Minimum parcel size of 40 contiguous acres.

D. Farm labor housing on a parcel with an existing dwelling under the following conditions:

(1) The proposed housing is necessary and accessory to a current agricultural use, and the operation is a commercial agricultural enterprise as determined by an evaluation of the criteria listed in Guideline 1.C(3) under "Review Uses," above.

(2) The housing shall be seasonal, unless it is shown that an additional full-time dwelling is necessary for the current agricultural use. Seasonal use shall not exceed 9 months.

(3) The housing shall be located to minimize the conversion of lands capable of production of farm crops and livestock, and shall not force a significant change in or significantly increase the cost of accepted agricultural uses employed on nearby lands devoted to agricultural use.

(4) Minimum parcel size of 40 contiguous acres. *(Added: U.S. Sec. Ag. concurrence 7/1/11)*

E. Agricultural structures, except buildings, in conjunction with agricultural use.

F. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

G. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.H or Guideline 1.I below.

H. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel less than or equal to 10 acres in size are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

I. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel larger than 10 acres in size are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 2,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The footprint of any individual accessory building shall not exceed 1,500 square feet.

(3) The height of any individual accessory building shall not exceed 24 feet.

J. Home occupations and cottage industries, subject to the guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies

and Guidelines). The use or development shall be compatible with agricultural use. Buffer zones should be considered to protect agricultural practices from conflicting uses.

K. Bed and breakfast inns, subject to the guidelines in "Bed and Breakfast Inns" (Part II, Chapter 7: General Policies and Guidelines). The use or development shall be compatible with agricultural use. Buffer zones should be considered to protect agricultural practices from conflicting uses.

L. Fruit stands and produce stands, upon a showing that sales will be limited to agricultural products raised on the property and other agriculture properties in the local region.

M. Aquaculture.

N. Exploration, development, and production of sand, gravel, and crushed rock for the construction, maintenance, or reconstruction of roads used to manage or harvest commercial forest products on lands within the SMA.

O. Utility facilities necessary for public service, upon a showing that:

(1) There is no alternative location with less adverse effect on Agriculture lands.

(2) The size is the minimum necessary to provide the service.

P. Temporary asphalt/batch plant operations related to public road projects, not to exceed 6 months.

Q. Community facilities and nonprofit facilities related to agricultural resource management.

R. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

S. Expansion of existing nonprofit group camps, retreats, and conference or education centers for the successful operation on the dedicated site. Expansion beyond the dedicated site is prohibited.

T. Public recreation, commercial recreation, interpretive, and educational developments and uses, consistent with the guidelines in Part I, Chapter 4: Recreation Resources.

U. Road and railroad construction and reconstruction.

V. Agricultural product processing and packaging, upon demonstration that the processing will be limited to products produced primarily on or adjacent to the property. "Primarily" means a clear majority of the product as measured by volume, weight, or value.

W. On a parcel of 40 acres or greater with an existing dwelling, the temporary use of a mobile home in the case of a family hardship, subject to the guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

X. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

Y. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

Z. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

AA. Disposal sites managed and operated by the Oregon Department of Transportation, the Washington State Department of Transportation, or a Gorge county public works department for earth materials and any intermixed vegetation generated by routine or emergency/disaster public road maintenance activities within the Scenic Area, subject to compliance with the guidelines in "Disposal Sites for Spoil Materials from Public Road Maintenance Activities" (Part II, Chapter 7: General Policies and Guidelines).

CHAPTER

2

Forest Land

The forest products industry historically was a mainstay of the Gorge economy. Its role has diminished in recent decades. The industry depends on lands inside and outside the Scenic Area for logs. Forest lands within the Scenic Area include parts of the Mt. Hood National Forest in Oregon and the Gifford Pinchot National Forest in Washington. The State of Washington owns substantial areas of land managed by the Department of Natural Resources. There are also large holdings of industrial forest land and substantial non-industrial, small woodlands within the Scenic Area.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act directs the Gorge Commission and the Forest Service to "protect and enhance forest lands for forest uses and to allow, but not require, conversion of forest to agricultural lands, recreation development or open spaces" [Section 6(d)(2)].

The Act defines forest lands to be those lands "used or suitable for the production of forest products" [Section 6(b)(3)].

Section 17(c) of the Act precludes the regulation of forest practices within the GMA. SMA forest practices, specifically "the management, utilization or disposal of timber resources," are not exempted from regulation stemming from the Act.

KEY ISSUES

The amount of land used for timber production in Washington and Oregon is on the decline. Public and private forest lands available for harvest are shrinking as a result of a number of factors, including conversion to non-forest uses and allocation of forest land by public agencies to other uses that preclude forest practices. Because public agencies, primarily those dealing with federal lands, are decreasing the acreage of land available for harvest, it is increasingly important that private industrial and non-industrial forest lands are managed and protected for the production of forest products.

Forest lands need to be protected from direct conversion to non-resource use and from conflicts with adjacent land uses that impede accepted forest practices and provide disincentives to forest management. Land divisions in forest lands need to discourage speculation in forest and recreation homesites and provide the opportunity for continuous growing and harvesting in an economically efficient manner. As

with agricultural lands, there are increasing conversion pressures placed upon forest lands from Portland/Vancouver metropolitan area growth and the expansion of tourism and recreation in the central Gorge.

OVERVIEW OF FOREST LAND PROVISIONS

The GMA provisions provide for three forest designations: Commercial Forest Land, Large Woodland, and Small Woodland. These designations ensure protection of all forest land that can contribute to the production of forest products, and recognize the different levels of management occurring in the Scenic Area. SMA policies designate Non-Federal and Federal forest land.

GMA policies only allow land divisions in the Commercial Forest and Large Woodland designations when necessary to facilitate forest management. Minimum parcel sizes in the Small Woodland designation protect forest land from conversion and ensure efficient forest management. The Scenic Area Act precludes land divisions in the SMA.

Both the GMA and SMA provisions establish use policies and guidelines that protect forest land from conflicting uses and conversion. Guidelines establish uses that may be allowed and criteria to be used to determine consistency with plan policies. GMA guidelines also establish fire protection criteria and siting criteria for dwellings that both protect forest land and maximize the efficient use of a parcel. Dwellings are not permitted on parcels less than 40 acres in size within the SMA.

SMA provisions also establish policies and guidelines for the review of forest practices in order to protect and enhance scenic, cultural, natural, and recreation resources.

GMA PROVISIONS

GMA Goal

Protect and enhance forest land for forest uses. Forest lands are those lands that are used for or suitable for the production of forest products.

GMA Objectives

1. Enhance forestry on lands designated Commercial Forest Land or Large or Small Woodland by encouraging consolidation of small, inefficient parcels into more efficient ownerships.

2. Enhance forestry by encouraging Washington and Oregon to consider grants and loans to secondary processors of forest products under Section 11 of the Scenic Area Act and other economic development programs.

GMA Policies

Designation Policies

1. Those lands that are used for the production of forest products shall be designated as Commercial Forest Land or Large or Small Woodland.

2. Those lands that are capable of growing 50 cubic feet per acre per year or more of merchantable tree species shall be designated as Commercial Forest Land or Large or Small Woodland.

3. In order to protect forest lands from conflicting uses, those lands that are interspersed among and part of other lands that are used or suitable for forestry shall be designated as Commercial Forest Land or Large or Small Woodland.

4. Lands that have been committed by development to other uses shall not be deemed suitable for or used for forestry.

5. Those lands suitable for both forestry and agriculture shall be designated as Commercial Forest Land or Large or Small Woodland if the surrounding area is generally devoted to lands used for the production of forest products.

6. The diversity of forest operations within the Scenic Area shall be recognized by establishing different minimum parcel sizes and different dwelling standards that reflect differences in type of forestry operations, considering the following factors:

   A. Ownership class (industrial, non-industrial, public, etc.).

   B. Productivity of forest land.

   C. Size of ownership.

   D. Surrounding land use.

   E. Proximity to other types of forest land.

   F. Availability of structural fire protection services.

7. Forest designations shall include the following:

   A. Blocks of forest land shall be designated as Commercial Forest Land if they:

      (1) Contain lands in the industrial and public ownership classes that occur in large tracts (predominantly 160 acres or larger), have few residences, and are generally bounded by other lands in the same ownership

classes or by lands designated Large Woodland (predominantly 80 acres or larger).

(2) Contain lands in the non-industrial ownership class that occur in large tracts (predominantly 80 acres or larger), have few residences, have no organized structural fire protection services, are capable of growing 85 cubic feet per acre per year or more of merchantable tree species, and are generally bounded by lands in the large non-industrial, public, or industrial ownership classes.

B. Blocks of forest land shall be designated as Large Woodland if they:

(1) Contain lands in the non-industrial ownership class that occur in large tracts (predominantly 80 acres or larger), have few residences, have no organized structural fire protection services, are capable of growing 50 cubic feet per acre per year or more of merchantable tree species, and are generally bounded by other lands in the same ownership class or by lands in the industrial class.

C. Blocks of forest land shall be designated as Small Woodland if they:

(1) Contain lands in the non-industrial ownership class that occur in smaller tracts (predominantly 20 acres or larger), have organized structural fire protection services, are capable of growing 50 cubic feet per acre per year or more of merchantable tree species, and are generally bounded by other lands in the same ownership class or lands devoted to non-forest uses.

D. Small blocks of land that may themselves be deemed Large or Small Woodland shall be designated as Commercial Forest Land if residential development of them would conflict with the use of adjacent Commercial Forest Land or Large-Scale Agriculture land. Small blocks that are adjacent to Urban Areas, Residential, or Small-Scale Agriculture designations or that are physically buffered by natural or manmade barriers from adjacent Commercial Forest Land or Large-Scale Agriculture designations may be considered for Large or Small Woodland designations.

E. Lands shall be designated as Commercial Forest Land if they are within forest areas that are currently used for or suitable for Large-Scale Agriculture, but would otherwise qualify for designation as Commercial Forest Land or Large Woodland.

Land Use Policies

1. Conversion of forest land to agriculture or open space shall be allowed.

2. Conversion of forest land to recreation shall be allowed when consistent with the guidelines established for the recreation intensity classes (Part I, Chapter 4: Recreation Resources) and the Recreation Development Plan (Part III, Chapter 1).

3. Forest land shall be protected from uses on nearby lands that conflict with the production of forest products by limiting the number, size, proximity, and scale of conflicting uses on nearby lands.

4. Forest land shall be protected from conversion to residential use by establishing minimum sizes for the creation of new parcels and by specifying the uses that may occur and the conditions of approval on lands designated Commercial Forest Land or Large or Small Woodland.

5. Land divisions of lands designated Commercial Forest Land or Large Woodland shall be allowed to facilitate forest management. No resulting parcel may be less than 80 acres in size.

6. Lands designated Commercial Forest Land or Large Woodland may be divided to facilitate protection of scenic, cultural, natural, or recreation resources. Resulting parcel(s) may be used only for the purpose intended at the time of creation of the parcel(s) or for agriculture or forest use.

7. A minimum size shall be established for the creation of new parcels on lands designated Small Woodland, considering the common size of forest units in the area, the impact on management efficiency, the existing landscape setting, wildlife habitat, and other resource factors.

8. Lands designated Small Woodland may be divided into parcels as large or larger than the specified minimum parcel size, subject to the guidelines for land divisions in "Land Divisions and Cluster Development" (Part II, Chapter 7: General Policies and Guidelines). No resulting parcel may be less than 20 acres in size.

9. Local governments may allow creation of parcels smaller than the designated minimum parcel size on lands designated Small Woodland, and award a density bonus, in order to protect scenic, cultural, natural, or recreation resources.

10. Dwellings shall be allowed in conjunction with agriculture on lands designated Commercial Forest Land.

11. New residences shall be allowed on lands designated Large Woodland if they are shown to contribute substantially to effective and efficient growing, propagation, and harvesting of forest tree species.

12. Single-family dwellings shall be allowed in areas designated Small Woodland when:

    A. A dwelling is shown to be in conjunction with the growing, propagation, and harvesting of forest tree species, or

B. A dwelling is on a parcel shown not to be eligible for enrollment in the subject state's forest assessment program.

13. Forest lands shall be protected and enhanced by establishing fire protection standards for new structures located on lands designated Commercial Forest Land or Large or Small Woodland.

GMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Commercial Forest Land, Large Woodland, or Small Woodland.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Commercial Forest Land, Large Woodland, or Small Woodland.

Review Uses

1. The following uses may be allowed on lands designated Commercial Forest Land or Large or Small Woodland, subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. On lands designated Large Woodland, a single-family dwelling upon a demonstration that all of the following conditions exist:

      (1) The dwelling will contribute substantially to the growing, propagation, and harvesting of forest tree species. The principal purpose for locating a dwelling on lands designated Large Woodland is to enable the resident to conduct efficient and effective forest management. This requirement indicates a relationship between ongoing forest management and the location of a dwelling on the subject parcel. A dwelling may not always be required for forest management.

      (2) The subject parcel has been enrolled in the appropriate state's forest assessment program.

      (3) A plan for management of the parcel has been approved by the Oregon Department of Forestry or the Washington Department of Natural Resources and the appropriate local government. The plan must

indicate the condition and productivity of lands to be managed; the operations the owner will carry out (thinning, harvest, planting, etc.); a chronological description of when the operations will occur; estimates of yield, labor and expenses; and how the dwelling will contribute toward the successful completion of the operations.

(4) The parcel has no other dwellings that are vacant or currently occupied by persons not engaged in forestry and that could be used as the principal forest dwelling.

(5) The dwelling complies with the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter.

(6) A declaration has been signed by the landowner and recorded into county deeds and records specifying that the owners, successors, heirs, and assigns of the subject parcel are aware that adjacent and nearby operators are entitled to carry on accepted farm or forest practices on lands designated Commercial Forest Land, Large or Small Woodland, or Large-Scale or Small-Scale Agriculture.

B. On lands designated Small Woodland, one single-family dwelling on a legally created parcel upon the parcel's enrollment in the appropriate state's forest assessment program. Upon a showing that a parcel cannot qualify, a parcel is entitled to one single-family dwelling. In either case, the location of a dwelling shall comply with the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter. A declaration shall be signed by the landowner and recorded into county deeds and records specifying that the owners, successors, heirs, and assigns of the subject parcel are aware that adjacent and nearby operators are entitled to carry on accepted farm or forest practices on lands designated Commercial Forest Land, Large or Small Woodland, or Large-Scale or Small-Scale Agriculture.

C. One single-family dwelling if shown to be in conjunction with and substantially contributing to the current agricultural use of a farm. Guideline 1H of "Review Uses" (Part II, Chapter 1: Agricultural Land) shall be used to determine whether a dwelling is a farm dwelling. The siting of the dwelling shall comply with the "Approval Criteria for Fire Protection" in this chapter.

D. Temporary onsite structures that are auxiliary to and used during the term of a particular forest operation. "Auxiliary" means a use or alteration of a structure or land that provides help or is directly associated with the conduct of a particular forest practice. An auxiliary structure is located onsite, is temporary in nature, and is not designed to remain for the forest's entire

growth cycle from planting to harvesting. An auxiliary use is removed when a particular forest practice has concluded.

E. Temporary portable facility for the primary processing of forest products grown on a parcel of land or contiguous land in the same ownership where the facility is to be located. The facility shall be removed upon completion of the harvest operation.

F. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

G. Structures associated with hunting and fishing operations.

H. Towers and fire stations for forest fire protection.

I. Agricultural structures, except buildings, in conjunction with agricultural use, subject to the "Approval Criteria for Fire Protection" in this chapter.

J. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the "Approval Criteria for Fire Protection" in this chapter and the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

K. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.L or Guideline 1.M below.

L. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel less than or equal to 10 acres in size are subject to the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter and the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

M. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel larger than 10 acres in size are subject to the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter and the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 2,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The footprint of any individual accessory building shall not exceed 1,500 square feet.

(3) The height of any individual accessory building shall not exceed 24 feet.

N. The temporary use of a mobile home in the case of a family hardship, subject to the guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines) and the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter.

O. A second single-family dwelling for a farm operator's relative, subject to Guideline 1.K of "Review Uses" (Part II, Chapter 1: Agricultural Land) and the "Approval Criteria for Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter.

P. Private roads serving a residence, subject to the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter.

Q. Recreation development, subject to the guidelines established for the recreation intensity classes (Part I, Chapter 4: Recreation Resources) and the Recreation Development Plan (Part III, Chapter 1).

R. Construction or reconstruction of roads or modifications not in conjunction with forest use or practices.

S. Agricultural labor housing, under the following conditions:

(1) The proposed housing is necessary and accessory to a current agricultural use.

(2) The housing shall be seasonal, unless it is shown that an additional full-time dwelling is necessary to the current agricultural use of the subject agricultural unit. Seasonal use shall not exceed 9 months.

(3) The housing shall be located to minimize the conversion of lands capable of production of farm crops and livestock, and shall not force a significant change in or significantly increase the cost of accepted agricultural practices employed on nearby lands devoted to agricultural use.

T. On lands designated Commercial Forest Land, a temporary mobile home in conjunction with a timber operation, upon a finding that security personnel are required to protect equipment associated with a harvest operation or to protect the subject forest land from fire. The mobile home must be removed upon completion of the subject harvest operation or the end of the fire season. The placement of the mobile home is subject to the "Approval Criteria for the Siting of Dwellings on Forest Land" and "Approval Criteria for Fire Protection" in this chapter.

U. On parcels in Small Woodland, a land division creating parcels smaller than the designated minimum parcel size, subject to the guidelines for cluster development in "Land Divisions and Cluster Development" (Part II, Chapter 7: General Policies and Guidelines). If the designated minimum parcel size is 20 acres, this provision will apply to parcels 40 acres in size or larger. Similarly, if the designated minimum parcel size is 40 or 80 acres, this provision will apply to parcels 80 acres or larger or 160 acres or larger, respectively.

V. New cultivation, subject to compliance with guidelines for the protection of cultural resources (Part I, Chapter 2: Cultural Resources) and natural resources (Part I, Chapter 4: Natural Resources).

W. Life estates, subject to the guidelines in "Approval Criteria for Life Estates" in this chapter.

X. Land divisions, subject to the guidelines for minimum parcel sizes in land use Policies 4 through 9, "Land Use Policies," above.

Y. Lot line adjustments that would result in the potential to create additional parcels through subsequent land divisions, subject to the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

Z. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

AA. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

BB. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

CC. Commercial events on lands designated Large Woodland or Small Woodland, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

DD. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

2. The following uses may be allowed on lands designated Commercial Forest Land or Large or Small Woodland, subject to compliance with the guidelines for the protection of scenic, cultural, natural, and recreation resources and the "Approval Criteria for Specified Review Uses" in this chapter.

   A. Utility facilities and railroads necessary for public service upon a showing that (1) there is no practicable alternative location with less adverse effect on agricultural and forest lands and on scenic, cultural, natural and recreation resources and (2) the size is the minimum necessary to provide the service.

   B. Home occupations or cottage industries in an existing residence or accessory structure, subject to the guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines).

   C. Fruit and produce stands, upon a showing that sales will be limited to agricultural products raised on the subject farm and other farms in the local region.

   D. Wineries, in conjunction with onsite viticulture, upon a showing that processing of wine is from grapes grown on the subject farm or in the local region.

   E. Wine sales/tasting rooms, in conjunction with an on-site winery.

   F. Agricultural product processing and packaging, upon a showing that the processing will be limited to products grown primarily on the subject farm and sized to the subject operation.

   G. Exploration, development, and production of mineral and geothermal resources, subject to the guidelines in Part I, Chapter 1: Scenic Resources.

   H. Aquaculture.

   I. Boarding of horses. The reviewing agency shall make findings on property characteristics, parcel size and impacts to neighbors, and shall specify the maximum number of horses based on those findings.

   J. Temporary portable asphalt/batch plants related to public road projects, not to exceed 6 months.

   K. Expansion of existing nonprofit group camps, retreats, or conference centers.

L. Bed and breakfast inns in single-family dwellings, subject to the guidelines in "Bed and Breakfast Inns" (Part II, Chapter 7: General Policies and Guidelines) and provided that the residence:

(1) Is included in the National Register of Historic Places, or

(2) In Washington, is listed on the Washington State Register of Historic Places maintained by the Washington Office of Archaeology and Historic Preservation, or

(3) In Oregon, is identified and protected under local landmark status as approved pursuant to Oregon state land use regulations protecting historic structures.

M. Nonprofit, environmental learning or research facilities.

N. On parcels designated Small Woodland, small-scale fishing support and fish processing operations on parcels that are contiguous with and have direct access to the Columbia River, subject to the guidelines in "Small-Scale Fishing Support and Fish Processing Operations" (Part II, Chapter 7: General Policies and Guidelines).

O. Disposal sites managed and operated by the Oregon Department of Transportation, the Washington State Department of Transportation, or a Gorge county public works department for earth materials and any intermixed vegetation generated by routine or emergency/disaster public road maintenance activities within the Scenic Area, subject to compliance with the guidelines in "Disposal Sites for Spoil Materials from Public Road Maintenance Activities" (Part II, Chapter 7: General Policies and Guidelines).

Approval Criteria for Fire Protection

1. All uses, as specified, shall comply with the following fire safety guidelines:

A. All buildings shall be surrounded by a maintained fuel break of 50 feet. Hazardous fuels shall be removed within the fuel break area. Irrigated or fire resistant vegetation may be planted within the fuel break. This could include green lawns and low shrubs (less than 24 inches in height). Trees should be spaced greater than 15 feet between the crowns and pruned to remove dead and low (less than 8 feet) branches. Accumulated leaves, needles, and other dead vegetation shall be removed from beneath trees.

B. Buildings with plumbed water systems shall install at least one standpipe a minimum of 50 feet from the structure(s).

C. A pond, stream, tank or sump with storage of not less than 1,000 gallons, or a well or water system capable of delivering 20 gallons per minute shall be

provided. If a well pump is located on-site, the electrical service shall be separate from the dwelling.

D. Access drives shall be constructed to a minimum of 12 feet in width and not exceed a grade of 12 percent. Turnouts shall be provided at a minimum of every 500 feet. Access drives shall be maintained to a level that is passable to fire equipment. Variances to road guidelines may be made only after consultation with the local rural fire district and the Washington Department of Natural Resources in Washington or the Oregon Department of Forestry in Oregon.

E. Within 1 year of the occupancy of a dwelling, the local government shall conduct a review of the development to assure compliance with these guidelines.

F. Telephone and power supply systems shall be underground whenever possible.

G. Roofs of structures should be constructed of fire-resistant materials such as metal, fiberglass shingle or tile. Roof materials such as cedar shake and shingle should not be used.

H. Any chimney or stovepipe on any structure for use with a woodstove or fireplace should be screened with no coarser than 1/4 inch mesh metal screen that is noncombustible and corrosion resistant and should be equipped with a spark arrestor.

I. All structural projections such as balconies, decks and roof gables should be built with fire resistant materials equivalent to that specified in the Uniform Building Code.

J. Attic openings, soffit vents, foundation louvers or other ventilation openings on dwellings and accessory structures should be screened with no coarser than 1/4-inch mesh metal screen that is noncombustible and corrosion resistant.

Approval Criteria for Siting of Dwellings on Forest Land

1. The approval of new dwellings and accessory structures on forest lands shall comply with the following guidelines:

   A. The dwelling and structures shall be sited on the parcel so that they will have the least impact on nearby or adjoining forest operations. Dwellings shall be set back at least 200 feet from adjacent properties. Clustering or locating proposed development closer to existing development on adjacent lands may minimize impacts on nearby or adjacent forest operations.

   B. The amount of forest land used to site dwellings, structures, access roads, and service corridors shall be minimized. This can include locating new

dwellings and structures as close to existing public roads as possible, thereby minimizing the length of access roads and utility corridors; or locating the dwelling, access road, and service corridors on portions of the parcel that are least or poorly suited for forestry. Areas may not be suitable for forestry because of existing non-forest uses, adjacent dwellings, or land productivity.

C. Dwellings shall be located to minimize the risks associated with wildfire. Dwellings should be located on gentle slopes and in any case not on slopes that exceed 40 percent. Narrow canyons and draws should be avoided. Dwellings should be located to minimize the difficulty of gaining access to the structure in the case of fire. Dwellings should be located to make the access roads as short and flat as possible.

D. A local government may grant a variance to the siting guidelines contained within this section upon a demonstration that the guidelines in "Variances from Setbacks and Buffers" (Part II, Chapter 7: General Policies and Guidelines) have been satisfied.

Approval Criteria for Life Estates

1. A landowner who sells or otherwise transfers real property on lands designated Commercial Forest Land or Large or Small Woodland may retain a life estate in a dwelling and a tract of land surrounding the dwelling. The life estate tract shall not be considered a parcel as defined in the Management Plan. A second dwelling unit on lands designated Commercial Forest Land or Large or Small Woodland may be allowed, subject to compliance with the guidelines for the protection of scenic, cultural, natural, and recreation resources and upon findings that:

   A. The proposed dwelling is in conjunction with agricultural use, using Guideline 1.H of "Review Uses" (Part II, Chapter 1: Agricultural Land); or

   B. On lands designated Large Woodland, the dwelling will contribute substantially to the growing, propagation, and harvesting of forest tree species. The proposed dwelling shall comply with Guideline 1.A of "Review Uses" in this chapter; or

   C. On lands designated Small Woodland, the proposed dwelling complies with Guideline 1.B of "Review Uses" in this chapter; and

   D. Upon termination of the life estate, the original or second dwelling shall be removed.

Approval Criteria for Specified Review Uses

1. The uses identified under Guideline 2 under "Review Uses," above, may be allowed only if they meet all of the following criteria:

A. The owners of land that is designated Commercial Forest Land, Large or Small Woodland, or Large-Scale or Small-Scale Agriculture and that lies within 500 feet of the perimeter of the subject parcel have been notified of the land use application and have been given at least 10 days to comment prior to a final decision.

B. The use will not seriously interfere with accepted forest or agricultural practices on nearby lands devoted to resource use.

C. The use will be sited in a way that minimizes the loss of forest or agricultural land and minimizes the chance of interference with accepted forest or agricultural practices on nearby lands.

D. The use will not significantly increase fire hazard, fire suppression costs, or risks to fire suppression personnel and will comply with the "Approval Criteria for Fire Protection" in this chapter.

SMA PROVISIONS

SMA Goal

Protect and enhance forest lands for forest uses.

SMA Policies

1. Only lands determined used for or suitable for the production of commercial forest products shall be designated Forest land.

2. Lands that have greater than 10 percent of their area covered by commercial species of timber and that meet the definition of suitability (see glossary) are considered suitable for Forest land designation.

3. All new developments and land uses shall protect natural, scenic, cultural, and recreation resources.

4. A site plan shall be prepared by the applicant prior to any forest practice.

5. The Forest Service shall, in collaboration with county and/or state regulatory agencies, review site plans for forest practices for compliance with SMA forest practice guidelines. The Forest Service review of the site plans shall include the following analysis:

    A. Protection of the scenic resources: analysis of potential impacts, including cumulative effects, to scenic values as viewed from the key viewing areas.

    B. Protection of the cultural resources: analysis of potential impacts to the cultural resources, including cumulative effects.

    C. Protection of natural resources: analysis of potential impacts, including cumulative effects, to the natural resources.

    D. Protection of the recreational resources: analysis of potential impacts to the recreational resources, including cumulative effects.

6. Forest Service review decisions on forest practices are subject to review by the Regional Forester.

7. New dwellings shall not be permitted on parcels of land less than 40 contiguous acres in size.

8. New dwellings shall only be allowed if shown to be necessary for and accessory to forest use, with an approved forest management plan, or necessary for and accessory to agricultural use, as specified in Part II, Chapter 1: Agricultural Land.

9. Research and development programs that protect and develop markets for secondary manufacturing and increased utilization of wood products and use of other miscellaneous forest products from the National Scenic Area are encouraged and will be supported by the Forest Service National Scenic Area office.

10. Use of Forest Land for agriculture, open space, and public recreation shall be allowed and shall comply with the appropriate land use designation policies and guidelines. Use of Non-Federal Land for commercial recreation is allowed and shall comply with the provisions in Part I, Chapter 4: Recreation Resources.

11. Conversion of lands designated Forest Land to Agriculture or Open Space is allowed.

12. Chemical use in conjunction with all forest practices shall conform with existing local, state, and federal laws and regulations relating to the use of chemicals.

13. Fire protection siting guidelines and standards for dwellings shall be developed by the county to protect forest resources from wildfires.

14. Forest landowners shall be encouraged to develop plans for long-term management of their property to protect and enhance the forest resource.

15. The Forest Service shall work with local landowners to provide technical assistance for planning mitigation measures necessary for forest practices and to explain potential federal land acquisition options.

16. All National Forest System lands shall be subject to the laws and regulations pertaining to the National Forest system, including the National Environmental Policy Act (NEPA), the Mt. Hood National Forest Land and Resource Management Plan, and the Gifford Pinchot National Forest Land and Resource Management Plan as amended by the Northwest Forest Plan. The most protective standards of the National Scenic Area Management Plan or the respective Forest Land and Resource Management Plans (as amended by the Northwest Forest Plan) shall apply to National Forest System lands.

17. Forest management of National Forest System lands shall be for the purpose of ecosystem management and forest health.

18. Forest practices on National Forest System lands in the General Management Area shall comply with the Special Management Area forest practice guidelines.

SMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Forest.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Forest.

Review Uses

1. The following uses may be allowed on lands designated Forest subject to review for compliance with scenic, cultural, natural, and recreational resources guidelines. The use or development shall be sited to minimize the loss of land suitable for the production of forest products:

   A. All review uses allowed for in Part II, Chapter 1: SMA Agricultural Land.

   B. New cultivation or new agricultural use outside of previously disturbed and regularly worked fields or areas. Clearing trees for new agricultural use is subject to the additional requirements of 1.W of this chapter.

   C. Railroad and road construction or reconstruction.

   D. Exploration, development, and production of sand, gravel, or crushed rock for the construction, maintenance, or reconstruction of roads used to manage or harvest commercial forest products in the SMA.

   E. Silvicultural nurseries.

   F. Utility facilities for public service, upon a showing that:

      (1) There is no alternative location with less adverse effect on Forest Land.

      (2) The size is the minimum necessary to provide the service.

   G. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

   H. Fish hatcheries and aquaculture facilities.

   I. Public recreation, commercial recreation, interpretive and educational developments, and uses consistent with the provisions of Part I, Chapter 4: Recreation Resources.

J. One single family dwelling on a parcel of 40 contiguous acres or larger if an approved forest management plan demonstrates that such a dwelling is necessary for and accessory to forest uses. The forest management plan shall demonstrate the following:

(1) The dwelling will contribute substantially to the growing, propagation, and harvesting of trees. The principal purpose for allowing a dwelling on forest lands is to enable the resident to conduct efficient and effective management. This requirement indicates a relationship between ongoing forest management and the need for a dwelling on the subject property.

(2) The subject parcel has been enrolled in the appropriate state's forest assessment program.

(3) A plan for management of the parcel has been approved by the Oregon Department of Forestry or the Washington Department of Natural Resources and the appropriate county. The plan must indicate the condition and productivity of lands to be managed; the operations the owner will carry out (thinning, harvest, planting, etc.); a chronological description of when the operations will occur; estimates of yield, labor, and expenses; and how the dwelling will contribute toward the successful management of the property.

(4) The parcel has are no other dwellings that are vacant or currently occupied by persons not engaged in forest management of the subject parcel.

(5) The dwelling complies with county dwelling, siting, and state/county fire protection guidelines.

(6) A declaration has been signed by the landowner and recorded into county deeds and records specifying that the owners, successors, heirs, and assigns of the subject property are aware that adjacent and nearby operations are entitled to carry on accepted agricultural or forest practices.

K. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.L or Guideline 1.M below.

L. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel less than or equal to 10 acres in size are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit

refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

M. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel larger than 10 acres in size are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 2,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The footprint of any individual accessory building shall not exceed 1,500 square feet.

(3) The height of any individual accessory building shall not exceed 24 feet.

N. Home occupations and cottage industries, subject to the "Home Occupations and Cottage Industries" guidelines in Part II, Chapter 7: General Policies and Guidelines.

O. Temporary portable facilities for the processing of forest products.

P. Towers and fire stations for forest fire protection.

Q. Community facilities and nonprofit facilities related to forest resource management; or expansion of existing nonprofit group camps, retreats, or conference or education centers, necessary for the successful operation of the facility on the dedicated site. Expansion beyond the dedicated site shall be prohibited.

R. On a parcel of 40 acres or greater with an existing dwelling, the temporary use of a mobile home in the case of a family hardship, subject to the guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

S. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

T. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

U. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

V. Disposal sites managed and operated by the Oregon Department of Transportation, the Washington State Department of Transportation, or a Gorge county public works department for earth materials and any intermixed vegetation generated by routine or emergency/disaster public road maintenance activities within the Scenic Area, subject to compliance with the guidelines in "Disposal Sites for Spoil Materials from Public Road Maintenance Activities" (Part II, Chapter 7: General Policies and Guidelines).

W. Clearing trees for new agricultural use with the following steps and subject to the following additional guidelines:

(1) A Stewardship Plan shall be submitted and deemed complete by the local government and submitted to the Forest Service for review. (See Stewardship Plan Requirements).

(2) Clearing trees for new agricultural use shall be limited to 15 acres.

(3) If the Stewardship Plan proves that the above guideline is detrimental to the proposed agricultural use, the final size of the clearing shall be determined by the application of Guidelines 1.W(4)(a-d) below and subject to Guideline 1.W(9).

(4) After a 30-day public comment period, the Forest Service shall review the Stewardship Plan using the following criteria:

(a) Scenic Resource guidelines in Review Uses 1.X(4)(a) and (g) in this chapter.

(b) Applicable Chapter I Cultural, Natural and Recreational Resource guidelines.

(c) The Natural Resource Conservation Service (NRCS) soil unit description shall indicate that soils are suitable for the proposed agricultural use. The woodland management tables shall be used as part of the analysis of suitability for both agricultural and forest uses.

(d) The size, shape and pattern on the landscape of the clearing for the new agricultural use shall blend with the surrounding landscape pattern either because the existing pattern includes agricultural openings or because the new agricultural opening is designed to appear natural.

(5) The Forest Service shall send the review statement to the appropriate local government planning office. The Forest Service shall state

whether or not the new agricultural use should proceed including any conditions that are recommended to be required by the county.

(6) The local government will accept an application for new agricultural use on forested lands after receipt of a positive review statement from the Forest Service.

(7) The forest practice portion of the new agricultural use shall not be approved by the state forestry department or local government until a decision on the new agricultural use is issued from the local government.

(8) The new agricultural use shall be operational within two years of the time frame described in the approved Stewardship Plan.

(9) New agricultural uses with an approved Stewardship Plan requiring more than 15 acres shall attain the final approved size sequentially. After the first 15 cleared acres is operational, each subsequent clearing shall not occur until the previous clearing is operational.

X. Forest practices in accordance with an approved forest practices application (see application requirements) and subject to the additional guidelines in this chapter**.**

(1) The following information, in addition to general site plan requirements (see Part II, Chapter 7: General Policies and Guidelines) shall be required:

(a) Delineate the following on a recent aerial photo or detailed map:

(i) The size, shape, and exact location of the proposed treatment area including any clumps of leave trees to remain. If more than one silvicultural prescription is to be used, code each on the photo.

(ii) Other important natural features of the subject parcel such as steep areas, streams, wetlands, rock outcrops, etc.

(iii) Road and structure construction and/or reconstruction location.

(iv) Location of proposed rock or aggregate sources.

(v) Major skid trails, landings, and yarding corridors.

(vi) Commercial firewood cutting areas.

(vii) Protection measures for scenic, cultural, natural, and recreation resources, such as road closures.

(b) Describe the existing forest in terms of species, ages, sizes, landscape pattern (including how it fits into the surrounding landscape pattern) and canopy closure for all canopy layers.

(c) Describe how the forest practice will fit into the existing landscape pattern and how it will meet scenic and natural resource standards in Review Uses 1.X(4)(a-g) and 1.X=(5)(a-d).

(d) Written silvicultural prescriptions with projected post-treatment forest condition specified in terms of species, ages, sizes, landscape pattern (including how it fits into the surrounding landscape pattern) and canopy closure for all canopy layers.

(e) Road and structure construction and/or reconstruction design.

(f) Existing and proposed rock pit development plans.

(g) A discussion of slash disposal methods.

(h) A reforestation plan as reviewed by the appropriate state forest practices agency.

(2) As part of the application, flag, stake or mark buffers, any trees or downed wood to be retained or removed (whichever makes the most sense), and areas for placing fill or removing material in preparation for a field visit by the reviewer.

(3) Stewardship Plan Requirements: The following information, in addition to the applicable portions of the forest practice application requirements above and general site plan requirements (see Part II, Chapter 7: General Policies and Guidelines) shall be provided:

(a) Outline the long term goals, proposed operations, and future sustainability of the subject parcel.

(b) Describe the time frame and steps planned to reach the long term goals.

(c) For Forest Practices, describe how the proposed activities fit into the long term goals and sustainability of the parcel and/or forest health. The following shall be addressed:

(i) Describe the range of natural conditions expected in the forest in terms of tree species, structure, and landscape pattern.

(ii) Describe what the resulting tree species, structure, and landscape pattern will be after the proposed activities.

(iii) Give a clear explanation how a deviation from the applicable guidelines may better achieve forest health objectives.

(iv) Give a clear explanation how and why the proposed activities will lead the forest towards its range of natural variability and result in reaching sustainability, resiliency to disturbances.

(d) For clearing trees for new agricultural use, the following shall be addressed in addition to X(3)(a) and (b) above:

(i) Submit NRCS soil unit description and map for each soil unit affected by the proposed clearing or treatment.

(ii) Based on the needs of the operation, give a clear explanation as to the exact size of the clearing needed and how it will meet the natural and scenic requirements set forth in W(4)(a-d) in this chapter.

(iii) Describe in sufficient detail for evaluation the proposed agricultural use, the improvements needed on the parcel, time line for its establishment, and its marketability.

(iv) Show evidence that an agricultural specialist, such as the county extension agent, has examined and found the proposed agricultural use reasonable and viable.

(4) For forest practices, the following scenic resource guidelines shall apply:

(a) Forest practices shall meet the design guidelines and scenic standards for the applicable landscape setting and zone (See Required SMA Scenic Standards table, SMA Guidelines for Development Visible from KVAs, SMA Scenic Resource Provisions, Part I, Chapter I).

(b) In the western portion (to White Salmon River) of the SMA Coniferous Woodland Landscape Setting, no more than 8% of the composite KVA viewshed from which the forest practice is topographically visible shall be in created forest openings at one time. The viewshed boundaries shall be delineated by the Forest Service.

(c) In the western portion (to the White Salmon River) of the SMA Gorge Walls, Canyonlands and Wildlands Landscape Setting, no more than 4% of the composite KVA viewshed from which the forest practice is topographically visible shall be in created forest openings at one time. The viewshed boundaries shall be delineated by the Forest Service.

(d) For all other landscape settings, created forest openings visible at one time shall be within the desired range for the vegetation type as set forth in Natural Resources guidelines in Review Uses 1.X(5)(a)-(c) in this chapter.

(e) Size, shape, and dispersal of created forest openings shall maintain the desired natural patterns in the landscape as set forth in Natural Resources guidelines in Review Uses 1.X(5)(a)-(c) in this chapter.

(f) The maximum size of any created forest opening is set forth by the "Desired" vegetation type in the Forest Structure and Pattern Table.

(i) If the treatment is proposed to go beyond the above guideline based on forest health or ecosystem function requirements, a Stewardship Plan shall be required.

(ii) If the Stewardship Plan proves that the above guideline is detrimental to either forest health or ecosystem function, the size of the created forest opening shall be within the natural range for the vegetation type as listed in the Desired Forest Structure and Pattern Table for each vegetation type, shall not mimic catastrophic fires, and shall maintain scenic standards.

(g) Created forest openings shall not create a break or opening in the vegetation in the skyline as viewed from a key viewing area.

(5) Forest practices shall maintain the following in addition to applicable natural resources guidelines in Part I, Chapter 4, SMA Natural Resources:

(a) Silvicultural prescriptions shall maintain the desired natural forest stand structures (tree species, spacing, layering, and mixture of sizes) based on forest health and ecosystem function requirements. Forest tree stand structure shall meet the requirements listed in the Desired Forest Structure and Pattern Table for each vegetation type. Forest tree stand structure is defined as the general structure of the forest in each vegetation type within which is found forest openings.

(b) Created forest openings shall be designed as mosaics not to exceed the limits defined as Desired in the Desired Forest Structure and Pattern Table unless proposed as a deviation as allowed under the scenic resource guideline in Review Uses 1.X(4)(f).

(c) Snag and down wood requirements shall be maintained or created as listed in the Desired Forest Structure and Pattern Table for each vegetation type.

(d) If the treatment is proposed to deviate from the snag and down wood requirements based on forest health or ecosystem function requirements, a Stewardship Plan shall be required and shall show and prove why a deviation from the snag and down wood requirements is required.

DESIRED FOREST STRUCTURE AND PATTERN

1	2	3		4		5	6	7
Vegetation Type#	**Forest Structure** (Average % total canopy closure (cc))*	**Typical Forest Opening s Size** Disturbance caused		**Percent Openings at One Time**		**Leave Trees** Includes all available remnant old forest	**Average Down Wood** Pieces 30 ft long per acre (scattered)	**Average Snags** (Conifers) No. per acre Snags are 20-40 ft in height
		Historic (Natural)	**Desired**	**Historic (Natural)**	**Desired**			
West Conifer	60-80% canopy closure Understory layer variable (0-60% of total cc)	Variable sizes with mosaic pattern, irregular shapes Mosaic fire 1-100 acres Catastrophic fire over 100 acres	Retain forested character Allow openings up to 15 acres (up to 5 acres in the foreground of KVAs) All openings 1 acre or less on National Forest land and all Open Space LUD Openings retain 15 - 40 % canopy closure	10% (mosaic fire) up to 55% (catastrophic fire) Intense fire return interval is 300 yrs	Not to exceed 8% for West Coniferous Woodland Landscape Setting and not to exceed 4% for Gorge Walls, Canyonlands and Wildlands Landscape Setting Widely dispersed, variable sized mosaic of irregular shapes blending with existing openings	Leave 15% of existing trees per acre throughout opening and in clumps Include 3 trees per acre of the largest size trees available	18 - 25 pieces greater than 20" dbh	10 snags at 10" -20" dbh, and 7 snags greater than 20" dbh
East Conifer (Ponderosa Pine/Douglas fir)	40-80% canopy closure Understory layer less than 25% of total cc	Few Openings due to low intensity fires \\¼ to 2 acres	Openings less than 1 acre Openings have 0 - 40% canopy closure Openings widely dispersed	1 -10%	1 - 10% (% by vegetation type)	No leave trees required	3 - 6 pieces greater than 20" dbh	5 snags at 10"-20" dbh and 3 snags greater than 20" dbh
Ponderosa Pine/ Oregon Oak	25-60% canopy closure Understory layer greater than 25% of total cc.	Most natural openings due to poor soil Disturbance openings few	Openings less than 1 acre Openings have 0 - 25% canopy closure Openings widely dispersed	1 -10%	1 - 10% (% by vegetation type)	No leave trees required	1 - 3 pieces greater than 20" dbh	5 snags at 10" - 20" dbh and 3 snags greater than 20" dbh Oak snags can be counted if already dead or partially dead

Map available at the Forest Service National Scenic Area Office
* Does not apply to openings.
Dbh: Diameter at Breast Height

CHAPTER

3

Open Space

The Columbia Gorge's diverse open space resources have in large part accounted for its reputation for superlative scenery, unique and varied ecosystems and habitats, rich heritage, and quality recreation opportunities. Unlike remote wilderness areas, the Gorge has long been a major transportation and commercial corridor, containing within its bounds major highways, federal dams, railroads, and numerous settlements. Despite this, many of its inspiring vistas, historic sites, and natural areas remain intact. These open spaces typify the features of the Gorge that make it such a special place. They offer a glimpse into a region blessed with outstanding resources, yet readily accessible for public enjoyment and enrichment.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act calls upon the Gorge Commission to "protect and enhance open spaces." The Act also charges the Gorge Commission to designate land suitable for the protection and enhancement of open spaces. The Act [Section 2(l)] defines open spaces to include:

1. Scenic, cultural, and historic areas;
2. Fish and wildlife habitat;
3. Lands which support plant species that are endemic to the scenic area or which are listed as rare, threatened or endangered species pursuant to State or Federal Endangered Species Acts;
4. Ecologically and scientifically significant natural areas;
5. Outstanding scenic views and sites;
6. Water areas and wetlands;
7. Archaeological sites, Indian burial grounds and village sites, historic trails and roads and other areas which are culturally or historically significant;
8. Potential and existing recreation resources; and
9. Federal and State wild, scenic, and recreation waterways.

KEY ISSUES

Open spaces represent some of the most significant and sensitive resources in the Scenic Area. A variety of techniques are employed in the Management Plan to protect these resources. They include regulating uses in and around the resources through application of guidelines to protect scenic, cultural, natural, and recreation

resources, and incentive programs to encourage landowners to protect such resources.

In some cases, the resources are so sensitive and significant that their protection requires designating them as Open Space. This land use designation is designed to protect such resources from uses that could adversely affect them. Some of the traditional land uses in the Gorge, such as farming, forestry, mining and residential development, could threaten the integrity of these important and potentially vulnerable resource areas mandated for protection in the Act. The protection and enhancement needs of these resources pose a significant challenge in the Management Plan.

A key issue related to this challenge involves the land use restrictions necessary to implement the Act's open space mandates. In some cases, this has necessitated limiting some existing or potential uses that may have economic value to landowners. Specifically, the need to retain reasonable economic uses on private lands while protecting open space resources presents a particularly difficult issue. In response, the Gorge Commission and Forest Service have applied the Open Space designation with great care, where it is the only effective way of meeting the Act's mandates.

OVERVIEW OF OPEN SPACE PROVISIONS

The policies for the GMA list the criteria used to determine which lands in the GMA qualify as Open Space. The policies also direct the Gorge Commission to help landowners prepare stewardship programs that protect and enhance open space resources. Stewardship programs may foster acquisition of open space lands where acquisition fulfills the objectives of a landowner.

The GMA guidelines include a list of uses that may occur on all lands designated Open Space. Guidelines for specific Open Space areas, such as Gorge Walls and Canyonlands or Chenoweth Natural Area, list additional uses that may be allowed. Most uses in Open Space may occur without review by a county planning department or the Gorge Commission. However, the Open Space guidelines do require some uses to be reviewed. For example, recreation uses can occur in Open Space only if they are found to comply with the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources). Some uses must satisfy conditions listed in the Open Space guidelines themselves. For example, the Oregon Natural Heritage Program must be consulted before scientific research may occur in the Chenoweth Natural Area.

The SMA policies establish four subcategories of Open Space: scenic, natural, wildlife, and cultural. They also require a management plan to be prepared for each Open Space area. The plans help ensure that sensitive open space resources are protected and enhanced. The elements to be addressed in each plan are listed in the SMA guidelines.

The SMA guidelines include a list of uses that may occur in Open Space without being reviewed by a county

planning department or the Forest Service. The SMA guidelines also specify uses that may be allowed in Open Space after a review determines they comply with the guidelines in the Management Plan that protect scenic, cultural, natural, and recreation resources.

GMA PROVISIONS

GMA Goal

Protect those most significant and sensitive scenic, cultural, natural, and recreation resources on unimproved lands from conflicting uses and enhance them where appropriate.

GMA Objectives

1. Encourage the Secretary of Agriculture to revise the boundaries of the SMA to include private lands in the GMA that are designated Open Space and that lie adjacent to or nearby an existing SMA boundary.

2. Encourage Congress to establish an SMA to protect the remarkable scenic, cultural, natural, and recreation resources of the GMA Gorge Walls and Canyonlands Open Space area along the Historic Columbia River Highway between Hood River and Mosier.

GMA Policies

1. Only the most significant and sensitive scenic, cultural, natural, and recreation resources shall be designated as Open Space.

2. Land shall be designated as Open Space only if the use limitations are consistent with landowner objectives, or if all of the following circumstances exist:

   A. Uses authorized by alternative designations threaten a documented resource.

   B. Protection of the resource is demonstrably in the public interest over the long term.

   C. All reasonable alternative means that might protect the resource and achieve landowner objectives have been considered and found not to provide adequate protection for the resource.

   D. No lands with improvements exist within the boundaries of the Open Space.

E. Landowners have reasonable economic uses of the balance of their properties.

3. The Gorge Commission shall work with owners of lands designated Open Space to develop a program of stewardship that protects Open Space resources and achieves landowner objectives.

   Where consistent with landowner objectives, the stewardship program should encourage appropriate public and private agencies to acquire interests in Open Space lands and should inform landowners of tax and other incentive programs.

   The Gorge Commission shall establish priorities for acquisition or exchange of lands whose owners object to the Open Space designation, and shall facilitate acquisition or exchange prior to its first review of the Management Plan.

   During its first review of the Management Plan, the Gorge Commission shall review the stewardship programs and the Open Space designations of areas containing lands whose owners object to the designation. Such reviews shall take into account acquisitions and exchanges completed since plan adoption.

4. Improved lands shall not be designated Open Space. For purposes of this chapter, improved lands are those upon which a structure or use subject to county ad valorem property taxation has been constructed or is being undertaken.

5. Open Space designation shall be applied to those most outstanding scenic areas that are highly visible in the foreground or middle ground from the Columbia River or scenic travel corridors and that are sensitive to uses that the Gorge Commission may not manage by regulation (such as forest practices).

6. Generally, well defined geographic areas that possess large concentrations of cultural resources shall be designated Open Space.

7. Undeveloped portions of state park lands suitable for low-intensity recreation and unsuitable for major recreation facilities shall be designated Open Space.

8. Those wetlands with remarkable values, such as sensitive wildlife habitat or rare plant species, that are susceptible to disturbance from use and development shall be designated Open Space.

9. Open Space designations shall be applied to those most significant and sensitive natural areas that are susceptible to disturbance from use and development.

10. Uses shall be allowed in areas designated Open Space that can be undertaken without adverse effect to the resources to be protected.

11. Habitat areas of animal species that are classified as endangered or threatened by federal or state endangered species acts or the Washington Wildlife Commission may be designated Open Space.

12. Uses authorized on private land designated Open Space shall be allowed with landowner permission only.

GMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, GMA and SMA Open Space" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Open Space.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) may be allowed with review through the expedited development review process on lands designated Open Space.

Review Uses--All Lands Designated Open Space

1. The following uses may be allowed on all lands designated Open Space subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

    A. Low-intensity recreation, subject to the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources).

    B. Land divisions to facilitate efforts to protect and enhance scenic, cultural, natural, or recreation resources.

    C. Repair, maintenance, operation, and improvement of existing structures, trails, roads, railroads, utility facilities, and hydroelectric facilities.

    D. Removal of timber, rocks or other materials for purposes of public safety and placement of structures for public safety.

    E. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

F. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

G. Lot line adjustments, subject to compliance with the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

Review Uses—Specific Lands Designated Open Space

Gorge Walls and Canyonlands

1. The following uses may be allowed on lands designated Open Space for Gorge Walls and Canyonlands subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. Livestock grazing.

   B. Fish and wildlife management uses conducted by federal, state, or tribal resource agencies.

   C. Soil, water, or vegetation uses performed in accordance with a conservation plan approved by a county conservation district.

   D. Harvesting of wild crops.

   E. Educational or scientific research.

   F. Continued operation of existing quarries, if they are determined to be consistent with guidelines to protect scenic, cultural, natural, and recreation resources.

   G. All those uses allowed in "All Lands Designated Open Space," above.

Mosley Lakes Natural Area

1. The following uses may be allowed on lands designated Open Space for the Mosley Lakes Natural Area subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. Fish and wildlife management uses conducted by federal, state, or tribal resource agencies, after consultation with the Washington Natural Heritage Program.

   B. Educational or scientific research, after consultation with the Washington Natural Heritage Program.

   C. Commercial trapping.

   D. All those uses allowed in "All Lands Designated Open Space," above.

Chenoweth Table Natural Area

1. The following uses may be allowed on lands designated Open Space for the Chenoweth Table Natural Area subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

    A. Low-intensity recreation, subject to the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources), after consultation with the Oregon Natural Heritage Program.

    B. Wildlife management uses conducted by federal, state, or tribal resource agencies, after consultation with the Oregon Natural Heritage Program.

    C. Educational or scientific research, after consultation with the Oregon Natural Heritage Program.

    D. All those uses allowed in "All Lands Designated Open Space," above.

Squally Point Natural Area

1. The following uses may be allowed on lands designated Open Space for the Squally Point Natural Area subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

    A. Except in the upland dunes south of the railroad tracks, low-intensity recreation, subject to the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources), after consultation with the Oregon Natural Heritage Program.

    B. Repair and maintenance of railroads, except measures to stabilize dunes, after consultation with the Oregon Natural Heritage Program.

    C. Except as limited by Guideline 1.A above, all those uses allowed in "All Lands Designated Open Space," above.

Klickitat River Wildlife and Natural Area

1. The following uses may be allowed on lands designated Open Space for the Klickitat River Wildlife and Natural Area subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

    A. Low-intensity recreation, subject to the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources), after consultation with the Washington Natural Heritage Program and Washington Department of Wildlife.

B. Wildlife management uses conducted by federal, state, or tribal resource agencies, after consultation with the Washington Natural Heritage Program.

C. Educational or scientific research, after consultation with the Washington Natural Heritage Program.

D. All those uses allowed in "All Lands Designated Open Space," above.

Balch Lake Wetlands Area

1. The following uses may be allowed on lands designated Open Space for the Balch Lake Wetlands Area subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. Livestock grazing, subject to a range conservation plan, after consultation with the Washington Department of Wildlife.

   B. Fish and wildlife management uses conducted by federal, state, or tribal resource agencies.

   C. Educational and scientific research, after consultation with the Washington Department of Wildlife.

   D. Low-intensity recreation, subject to the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources), after consultation with the Washington Department of Wildlife.

   E. All those uses allowed in "All Lands Designated Open Space," above.

Mouth of Wind River Wildlife Area

1. The following uses may be allowed on lands designated Open Space for the Mouth of Wind River Wildlife Area subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. Fish and wildlife management uses conducted by federal, state, or tribal resource agencies.

   B. Soil, water, or vegetation uses performed in accordance with a conservation plan approved by a local conservation district.

   C. Harvesting of wild crops.

   D. Educational or scientific research, after consultation with the Washington Department of Wildlife or Fisheries.

E. Commercial fishing and trapping.

F. Low-intensity recreation, subject to the guidelines for recreation intensity classes (Part I, Chapter 4: Recreation Resources), after consultation with the Washington Department of Wildlife.

G. All those uses allowed in "All Lands Designated Open Space," above.

State Park Recreation Areas

1. The following uses may be allowed on lands designated Open Space on those portions of state park ownerships not suitable for major recreation facilities subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. Fish and wildlife management uses conducted by federal, state, or tribal resource agencies.

   B. Soil, water, or vegetation uses performed in accordance with a conservation plan approved by a local conservation district.

   C. Harvesting of wild crops.

   D. Educational or scientific research.

   E. All those uses allowed in "All Lands Designated Open Space," above.

SMA PROVISIONS

SMA Goal

Protect and enhance open space values.

SMA Policies

1. Open Space shall be designated to provide special protection for sensitive scenic, cultural, recreational, and natural resources, and for sensitive and/or representative ecosystems.

2. Only unimproved lands shall be designated Open Space.

3. Open Space designation shall include the following subcategories:

   A. **Open Space/Scenic** protects the natural appearance of lands with high scenic values. These include areas of outstanding natural beauty, such as cliff faces, steep bluffs, canyons, water features, and tributary river corridors.

   B. **Open Space/Natural** protects wetlands, areas supporting ecologically and scientifically significant plant communities, and significant natural areas. Most of these areas contain concentrations of threatened, endangered, sensitive, and endemic plants, and sensitive plant associations that are rare or unusual.

   C. **Open Space/Wildlife** protects sensitive and unique habitat values and threatened, endangered, sensitive, and endemic species. These lands include habitat for significant wildlife species such as spotted owl, pine marten, pileated woodpecker, and anadromous fisheries.

   D. **Open Space/Cultural** protects concentrations of cultural resources. These lands contain known and potential significant concentrations of cultural resources.

4. An Open Space plan shall be developed for each Open Space area for protection and enhancement of resources in that area.

5. The Forest Service National Scenic Area office will facilitate the formation of partnerships with appropriate local, state, and federal agencies and private organizations, which will be encouraged to design and implement management programs to enhance Open Space values.

6. Educational and interpretive programs shall be encouraged to promote understanding and enhancement of resources, where these programs do not diminish the Open Space values.

7. New developments and land uses not included in the Open Space guidelines, including commercial forest practices, most structural development, and intensive recreation development, shall be prohibited in Open Space areas.

8. Federal and state agencies shall review Open Space areas to determine their potential for classification as research natural areas or state natural areas.

9. All National Forest System lands shall be subject to the laws and regulations pertaining to the National Forest system, including the National Environmental Policy Act (NEPA), the Mt. Hood National Forest Land and Resource Management Plan, and the Gifford Pinchot National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan. The most protective standards of the National Scenic Area Management Plan or the respective Forest Land and Resource Management Plans (as amended by the Northwest Forest Plan) shall apply to National Forest System lands.

10. If requested, the Forest Service shall help locate mapped boundaries of Open Space areas in cases of new land uses or development.

SMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, GMA and SMA Open Space" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Open Space.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Open Space.

Review Uses

1. An Open Space plan shall be completed by the primary managing agency or landowner prior to any new land uses or development, and shall be reviewed by the Forest Service. The Open Space plan shall include the following:

    A. Direction for resource protection, enhancement, and management.

    B. Review of existing uses to determine compatibility with Open Space values.

    C. Consultation with members of the public and with agency and resource specialists.

2. The following new uses may be allowed on lands designated Open Space subject to review for compliance with scenic, cultural, natural, and recreational resources guidelines:

   A. Changes in existing uses, including reconstruction, replacement, and expansion of existing structures and transportation facilities, except for commercial forest practices.

   B. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include vegetation management and forest practices (subject to the forest practice guidelines of Part II, Chapter 2: Forest Land) for the restoration of forest health, new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

   C. Low-intensity recreation uses and developments, including educational and interpretive facilities, consistent with Part I, Chapter 4: Recreation Resources.

   D. Utility facilities for public service, upon a showing that:

      (1) There is no alternative location with less adverse effect on Open Space land.

      (2) The size is the minimum necessary to provide the service.

   E. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

   F. Treatment of noxious weeds shall be permitted without completion of an SMA Open Space plan when the following criteria have been met:

      (1) Noxious weed infestation is new and eradication is still viable.

      (2) Delayed or deferred treatment could have widespread or major adverse impacts to one or more of the following resources:

         (a) Displacement of native and traditionally gathered plants;

         (b) Degradation of wildlife habitat and forage;

         (c) Degradation or loss of agricultural uses of land, such as cropland or livestock forage;

         (d) Limitation of recreational uses.

      (3) For federal lands, treatment effects have been thoroughly evaluated in an environmental assessment.

CHAPTER

4

Residential Land

The Gorge is currently home to nearly 55,000 people, the majority living in cities, towns and communities along the Columbia River.

Rural residential development has taken a marked upturn as people seek rural lifestyles and recreation homesites. Modern highways and technology are permitting many more people to pursue a rural lifestyle within reach of the amenities provided by local and regional service centers.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act encourages future residential development to occur in the Urban Areas, but also allows for rural residential development. The Act directs the Gorge Commission and Forest Service to "require that residential development outside urban areas take place without adversely affecting the scenic, cultural, recreation, and natural resources of the Scenic Area" [Section 6(d)(8)].

Sections 6(d)(1) and (2) of the Act do not allow agriculture and forest lands to be converted to residential use. When located outside Urban Areas, residential development shall be designated for areas "used or suitable for residential development, taking into account the physical characteristics of the areas in question and their geographic proximity to transportation and commercial facilities and other amenities" [Section 6(b)(6)].

KEY ISSUES

The Scenic Area Act encourages development, including residential, to locate within the 13 Urban Areas designated in the Scenic Area Act. This helps strengthen existing cities and towns, while reserving lands outside the Urban Areas for agriculture, forest, and recreation use and resource protection. The Scenic Area Act requires that agricultural and forest lands be protected. It does not include similar provisions for residential lands.

These mandates in the Act generate perhaps the most significant residential planning issue in the Scenic Area. Much of the land in the Scenic Area not already committed to residential use and not too steep for development is either used or suitable for agriculture or forest use. These lands are often highly capable of supporting residential development. As a result, demands for rural residential development in such areas can conflict with Scenic Area mandates for protection of resource lands.

Enclaves of rural residential development do now exist outside the Urban Area boundaries, including Corbett, Bridal Veil, Skamania, Underwood, and Rowena.

The designation of lands for residential use must take into account the circumstances in which land otherwise suitable for agricultural or forest use is nonetheless committed by past development decisions to residential use. Residential development must also be focused in areas that are suitable. Factors include proximity to amenities, public services, and transportation; avoidance of hazards; and the resources protected by the Scenic Area Act.

Another issue is the density at which residential development may occur. Too much residential development can change the landscape setting of an area and impact scenic resources. Lower densities help maintain the rural character of an area and keep the demand for services at levels that can be better met by rural service providers. Residential development can greatly impact adjacent agriculture and forest practices. Natural resources within and adjacent to residential areas, such as plant and wildlife habitat and wetlands, need to be protected. The Act specifically protects recreation. Residential use can conflict with existing and planned recreation use on adjacent lands. Finally, the density of residential development needs to take into account the carrying capacity of an area. Development should avoid hazards and be located where sewage disposal, water, and fire services are available.

OVERVIEW OF RESIDENTIAL LAND PROVISIONS

In the GMA, lands currently devoted to residential use and other lands that are nearby and committed to residential use are designated Residential. Plan policies outline the factors used to determine whether an area is committed to residential use. In the SMA, two areas of concentrated residential development, Rowena Dell and Latourell, are designated Residential.

The GMA policies establish minimum parcel sizes for new land divisions that protect scenic, cultural, natural, and recreation resources, adjacent agriculture and forest lands, and the landscape setting of an area, and that take into account the adequacy of services and the existence of any hazards. Minimum parcel sizes of 1, 2, 5 and 10 acres are listed. GMA provisions allow for smaller parcels in the 5-acre and 10-acre designations when clustering is used, and award a density bonus in such cases.

Both the GMA and SMA provisions establish land use policies and guidelines that allow uses that are consistent with the Scenic Area Act and compatible with residential use. GMA policies and guidelines also ensure protection of adjacent agricultural, forest, and recreation uses. In the GMA, one single-family dwelling may be permitted on each legally created parcel. *(Revised: U.S. Sec. Ag. concurrence 7/1/11)*

GMA PROVISIONS

GMA Goals

1. Protect and enhance the character of existing residential areas.

2. Ensure that residential development outside Urban Areas does not adversely affect scenic, cultural, natural, or recreation resources.

3. When designating lands for residential use, consider their physical characteristics and their geographic proximity to transportation, commercial facilities, and other amenities.

GMA Policies

Designation Policies

1. Those lands currently devoted to residential use and other lands that are nearby and committed to residential use shall be designated as Residential.

2. Residential development shall not adversely affect adjacent lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland.

3. In determining whether an area is committed to residential use, the following factors shall be considered:

   A. The relationship between a parcel and adjacent lands.

   B. Existing public facilities and services, including, but not limited to, sewer, water, police protection, fire protection, school bus routes, and roads.

   C. Parcel size(s) and ownership patterns. An examination must include a review of contiguous and non-aggregated ownerships that may, as constituent parcels, be used together for agriculture or forest use.

   D. Natural or manmade features or impediments separating an area from resource lands.

   E. The physical development of an area. An area may be physically developed to the extent that it is no longer available for resource use. This factor by itself does not commit an area to residential use.

   F. Evaluation of the long-term, cumulative impacts of residential development on resources. The factors to be considered include, but are not limited to, conversion of adjacent agricultural and forest lands; compatibility with

adjacent uses; impacts on water quality and quantity; effects on services; and impacts on scenic, cultural, natural, or recreation resources.

G. Other factors that would make agriculture or forest use impracticable.

Land Use Policies

1. Minimum parcel sizes for land divisions shall be established, based upon the following factors:

   A. Avoidance of hazards, including, but not limited to, steep slopes, fire danger, and groundwater pollution.

   B. Adequacy of services, including, but not limited to, transportation, fire protection, police protection, schools, sewage disposal and water.

   C. Protection of the following:

      (1) Existing landscape setting.

      (2) Wildlife habitat.

      (3) Plant habitat.

      (4) Scenic sensitivity.

      (5) Cultural resources.

      (6) Wetlands.

      (7) Scenic travel corridors.

   D. Potential for conflict with nearby agricultural and forest uses.

   E. Proximity to existing and planned recreation uses.

2. The following minimum parcel sizes shall be established:

   A. A 1-acre minimum for those lands designated Residential where single-family, residential development generally occurs at a density of one dwelling unit per acre or greater. Because these residential areas are generally linked to an adjacent Rural Center or Urban Area, the relatively high densities have a minimal impact on the factors listed in Policy 1, above.

   B. A 2-acre minimum for those lands designated Residential where parcelization and existing residential development occur at a density greater than 5 acres

and in a landscape setting where a rural character is somewhat retained. These lands occur in large-enough blocks to minimize the impacts on adjacent agriculture and forest lands. A 2-acre minimum shall not be established in such areas if the potential number of new parcels that could be created would have an adverse cumulative impact upon the factors listed in Policy 1, above.

C. A 5- or 10-acre minimum for those lands designated Residential that are situated in areas where a higher density would conflict with the factors listed in Policy 1, above. A 10-acre minimum shall be established where a 5-acre minimum would result in an adverse cumulative impact on one or more of the factors listed in Policy 1, above.

3. Local governments may allow creation of parcels smaller than the designated minimum parcel size on lands designated 5-acre Residential and 10-acre Residential, and may award a density bonus, in order to cluster new residences to protect scenic, cultural, natural, or recreation resources.

4. Adjacent agricultural and forest lands shall be protected from residential development.

5. New residential development within Residential designations located adjacent to forest land designations shall comply with the guidelines in "Approval Criteria for Fire Protection" (Part II, Chapter 2: Forest Land).

6. Except as specifically identified, all legally created, undeveloped parcels are entitled to one single-family dwelling, subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources. The location of a second dwelling unit on a parcel is not permitted, except in the case of a qualified temporary hardship dwelling.

7. Adjacent recreation uses shall be protected from residential development. Buffer areas shall be established between residential development and adjacent recreation uses.

GMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Residential.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Residential.

Review Uses

1. The following uses may be allowed on lands designated Residential, subject to compliance with the guidelines for the protection of scenic, cultural, natural, and recreation resources:

   A. One single-family dwelling per legally created parcel. If the subject parcel is located adjacent to lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland, the use shall comply with the buffer and notification requirements for agricultural land (Part II, Chapter 1) or forest land (Part II, Chapter 2). If the subject parcel is located within a Residential designation that is adjacent to lands designated Commercial Forest Land or Large or Small Woodland, the placement of a dwelling shall also comply with the fire protection guidelines in "Approval Criteria for Fire Protection" (Part II, Chapter 2: Forest Land).

   B. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.C below.

   C. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel are subject to the following additional standards:

      (1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

      (2) The height of any individual accessory building shall not exceed 24 feet.

   D. The temporary use of a mobile home in the case of a family hardship, subject to guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

   E. Construction or reconstruction of roads.

   F. On parcels 10 acres or larger in the 5-acre Residential designation, or 20 acres or larger in the 10-acre Residential designation, a land division creating new parcels smaller than the designated minimum parcel size, subject to the

guidelines for cluster development in "Land Divisions and Cluster Development" (Part II, Chapter 7: General Policies and Guidelines).

G. New cultivation, subject to compliance with guidelines for the protection of cultural resources (Part I, Chapter 2: Cultural Resources) and natural resources (Part I, Chapter 4: Natural Resources).

H. Land divisions, subject to the guidelines for minimum parcel sizes.

I. Lot line adjustments that would result in the potential to create additional parcels through subsequent land divisions, subject to the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

J. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

K. Agricultural structures, except buildings, in conjunction with agricultural use.

L. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

M. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

N. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

O. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

P. Commercial events, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

Q. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

2. The following uses may be allowed on lands designated Residential, subject to compliance with the guidelines for protection of scenic, cultural, natural, and recreation resources and "Approval Criteria for Specified Review Uses," below.

A. Accredited childcare centers within lands designated 1-acre Residential or 2-acre Residential. A childcare center may be allowed in other Residential designations within an existing church or community building.

B. Schools within an existing church or community building.

C. Expansion of existing primary or middle schools on land purchased prior to June 8, 1999. For purposes of this section, existing schools means public schools that existed prior to adoption of the original Management Plan on October 15, 1991.

D. Utility facilities and railroads.

E. Home occupations or cottage industries in an existing residence or accessory structure, subject to the guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines).

F. Fire stations.

G. Recreation development, subject to the guidelines established for recreation intensity classes (Part I, Chapter 4: Recreation Resources).

H. Community parks and playgrounds, consistent with the standards of the National Park and Recreation Society regarding the need for such facilities.

I. Bed and breakfast inns in single family dwellings located on lands designated 5-acre Residential or 10-acre Residential, subject to the guidelines in "Bed and Breakfast Inns" (Part II, Chapter 7: General Policies and Guidelines).

J. Wineries, in conjunction with onsite viticulture, upon a showing that processing of wine is from grapes grown on the subject farm or in the local region.

K. Wine sales/tasting rooms in conjunction with an on-site winery, under the following conditions:

(1) The use shall comply with the guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines), with the following exceptions:

(a) The use may employ an unlimited number of outside employees.

(b) The wine sales/tasting room may include interior and/or exterior space, provided the combined interior and exterior spaces shall not exceed 1,000 square feet.

(c) The interior space may be located in an existing building or in a new building or addition to an existing building constructed for the primary purpose of housing the wine sales/tasting room.

(d) The exterior space may be a veranda, patio, or other similar type of structure.

L. Small-scale fishing support and fish processing operations on parcels that are contiguous with and have direct access to the Columbia River, subject to the guidelines in "Small-Scale Fishing Support and Fish Processing Operations" (Part II, Chapter 7: General Policies and Guidelines).

M. Boarding of horses on lands designated 10-acre Residential. The reviewing agency shall make findings on property characteristics, parcel size and impacts to neighbors, and shall specify the maximum number of horses based on those findings.

Approval Criteria for Specified Review Uses

1. The uses identified in Guideline 2 under "Review Uses," above, may be allowed only if they meet all of the following criteria:

   A. The proposed use will be compatible with the surrounding area. Review of compatibility shall include impacts associated with the visual character of the area; traffic generation; and noise, dust, and odors.

   B. The proposed use will not require public services other than those existing or approved for the area.

   C. If the subject parcel is located within 500 feet of lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland, new buildings associated with the proposed use comply with the buffer guidelines in "Agricultural Buffer Guidelines" (Part II, Chapter 1: Agricultural Land).

   D. If the subject parcel is located within 500 feet of lands designated Commercial Forest Land or Large or Small Woodland, new buildings associated with the proposed use comply with the fire protection guidelines in "Approval Criteria for Fire Protection" (Part II, Chapter 2: Forest Land).

SMA PROVISIONS

SMA Goal

Allow concentrated residential development only at Rowena Dell and Latourell.

SMA Policies

1. New land divisions shall be prohibited.

2. New multifamily dwellings shall be prohibited.

3. Any new dwelling within the SMA Residential land use designation shall be on a parcel at least 40 acres in size. *(Added: U.S. Sec. Ag. concurrence 7/1/11)*

4. Existing uses of dwelling units in Rowena Dell will continue as allowed in Chapter 7 – General Policies and Guidelines, Existing Uses and Discontinued Uses. *(Revised: U.S. Sec. Ag. concurrence 7/1/11)*

5. At Latourell, contiguous lots under the same ownership as of November 17, 1986, are considered consolidated into a single parcel. Splitting of these consolidated parcels, including lot line adjustment, shall be prohibited.

6. New structures shall not adversely affect scenic, cultural, recreation, or natural resources.

7. All National Forest System lands shall be subject to the laws and regulations pertaining to the National Forest system, including the National Environmental Policy Act (NEPA), the Mt. Hood National Forest Land and Resource Management Plan, and the Gifford Pinchot National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan. The most protective standards of the National Scenic Area Management Plan or the respective Forest Land and Resource Management Plans (as amended by the Northwest Forest Plan) shall apply to National Forest System lands.

SMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Residential.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Residential.

Review Uses

1. The following uses may be allowed on lands designated Residential subject to review for compliance with scenic, cultural, natural, and recreation resources guidelines.

   A. One single-family dwelling per legally created lot or consolidated parcel not less than 40 contiguous acres. The placement of a dwelling shall comply with fire protection standards developed by the county, in accordance with SMA Policy 13 in Part II, Chapter 2: Forest Land. *(Revised: U.S. Sec. Ag. concurrence 7/1/11)*

   B. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.C below.

   C. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel are subject to the following additional standards:

      (1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

      (2) The height of any individual accessory building shall not exceed 24 feet.

   D. New utility facilities.

   E. Fire stations.

   F. Home occupations and cottage industries subject to the guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines).

   G. Bed and breakfast inns, subject to the guidelines in "Bed and Breakfast Inns" (Part II, Chapter 7: General Policies and Guidelines).

   H. Community parks and playgrounds.

   I. Road and railroad construction and reconstruction.

J. Forest practices, as specified in Part II, Chapter 2: Forest Land.

K. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

L. On a parcel of 40 acres or greater with an existing dwelling, the temporary use of a mobile home in the case of a family hardship, subject to the guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

M. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

N. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

O. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

P. New cultivation or new agricultural use outside of previously disturbed and regularly worked fields or areas. Clearing trees for new agricultural use is subject to the additional requirements of 1.W of Part II, Chapter 2: Forest Land.

CHAPTER

5

Commercial Land

There have been centers of trade and commerce in the Gorge for almost as long as humans have inhabited it. Gorge Indians were renowned traders.

With the exception of a few small community commercial nodes, the commercial centers are located within the 13 designated Urban Areas. These include Hood River, Stevenson, and White Salmon-Bingen, commercial centers that serve both local and regional needs. Smaller, rural community service centers include Carson, Lyle, Mosier, and Cascade Locks, as well as the communities of Corbett and Skamania, designated as Rural Centers in the Management Plan.

SCENIC AREA ACT PROVISIONS

The Scenic Area Act gives clear direction for commercial development in the Gorge: it is to be encouraged to locate within the 13 Urban Areas identified by Congress. The Act directs the Gorge Commission to "protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with" protecting and enhancing scenic, cultural, recreational, and natural resources [Section 3(2)].

The Act directs the Commission to "require that commercial development outside urban areas take place without adversely affecting the scenic, cultural, recreation, and natural resources of the Scenic Area" [Section 6(d)(7)].

New commercial development is not permitted in the SMA, except for commercial recreation. When located outside the Urban Areas, commercial development shall be designated for areas outside the SMA "used or suitable for commercial development: *Provided,* That such designations shall encourage, but not require, commercial development to take place in urban areas and shall take into account the physical characteristics of the areas in question and their geographic proximity to transportation, commercial, and industrial facilities and other amenities" [Section 6(b)(5)].

KEY ISSUES

Commercial development in the Scenic Area should reinforce the Act's orientation of promoting and protecting the vitality of Urban Areas, the long-standing centers of commercial trade in the Gorge. Planning provisions need to encourage major commercial development to locate in the 13 Urban Areas designated by Congress.

Commercial development does occur outside the Urban Areas. There are several commercial nodes and, quite noticeably, two rural communities that act as rural service centers and gathering places. These existing commercial areas provide important services to local communities and visitors and need to be protected.

Portland/Vancouver metropolitan area growth and the growing importance of tourism in the Gorge create demands for new commercial uses. Uncontrolled strip commercial development outside the Urban Areas could discourage new commercial growth in these Urban Areas and impact the rural character and scenic qualities of the main travel corridors. New commercial uses must be planned to protect the resources identified in the Scenic Area Act. Maintaining commercial uses to a rural scale helps to serve the rural communities without competing with Urban Areas. Home occupations, cottage industries, and bed and breakfast inns associated with residential use are other uses that can help the rural economy without placing many demands on rural services.

OVERVIEW OF COMMERCIAL LAND PROVISIONS

The remainder of this chapter is devoted to the GMA. The Scenic Area Act precludes new commercial development in the SMA, except for commercial recreation.

Commercial designations in the GMA recognize areas outside Urban Areas where commercial use took place in the immediate past or is currently taking place. The GMA policies outline factors for establishing two commercial designations: Rural Center and Commercial. The communities of Corbett, Oregon, and Skamania, Washington, are designated as Rural Centers. These communities include a unique mix of commercial, public, and residential uses. Corbett and Skamania serve the surrounding rural community as well as tourists.

GMA land use policies and guidelines allow commercial uses in the Rural Centers of a type and scale appropriate to serve the needs of the rural community and limited tourist needs. Uses that cater to the traveling or visiting public may be allowed in a Commercial designation. Building size is limited to 5,000 square feet of floor area per building or use. Both designations allow one single-family dwelling per legally created parcel.

Home occupations and cottage industries may be allowed in other designations if they are determined to be compatible with the surrounding area. Policies are also provided that allow bed and breakfast inns outside the Rural Center and Commercial designations in 5-acre Residential and 10-acre Residential designations and in historic dwellings in other areas. GMA guidelines also establish approval criteria to ensure that uses are rural in scale and compatible with surrounding areas.

Land divisions are allowed in the GMA. Parcel size for commercial development is determined by local governments, based upon site requirements such as sewerage, parking, and building size. Residential lot size is addressed in Part II, Chapter 4: Residential Land.

GMA PROVISIONS

GMA Goals

1. Protect and support the economy of the Columbia River Gorge by encouraging commercial uses to occur in existing Urban Areas.

2. Protect and support the economy of the Columbia River Gorge by allowing new commercial uses outside of Urban Areas where they will not adversely affect scenic, cultural, natural, or recreation resources.

GMA Policies

Designation Policies

1. Designation for commercial uses shall be given to those areas outside Urban Areas that are suited for such uses by physical characteristics, such as slope, and geographic proximity to transportation, commercial and industrial facilities, and other amenities.

2. Areas outside Urban Areas shall be designated as Commercial where commercial use took place in the immediate past or is now taking place and would not adversely affect scenic, cultural, natural, or recreation resources. A commercial use shall be considered to have taken place in the immediate past if it has been active and has not been discontinued for more than 1 year.

3. Areas shall be designated as Rural Center that act as service centers and gathering places for concentrations of rural residences and that have all of the following characteristics:

    A. Node of existing commercial uses, or an existing commercial core.

    B. Substantial concentration of rural residences.

    C. Public, noncommercial gathering place such as a grange hall.

    D. School.

    E. Fire station.

    F. Location along a major travel corridor.

    G. Definable area within which these characteristics occur.

Land Use Policies

1. Commercial uses shall be allowed outside Urban Areas on lands designated Rural Center, Commercial, or Commercial Recreation (Part II, Chapter 6: Recreation Designations) or as allowed in the recreation intensity classes (Part I, Chapter 4: Recreation Resources).

2. In Rural Centers, commercial uses shall be allowed of a type and scale appropriate to serve the needs of the rural community and limited tourist needs. Such commercial uses shall be limited to small-scale tourist commercial and community commercial to ensure that they do not change the rural character of the community or compete with nearby Urban Areas for the tourist trade.

3. Residential designations and densities in the vicinity of Rural Centers shall be established to limit the need for additional community commercial uses and community services to those lands that are currently available within the boundaries of existing Rural Centers.

4. On lands designated Commercial, single-family dwellings and uses that cater to the traveling or visiting public shall be allowed.

5. Home occupations and cottage industries may be allowed if they are compatible with the surrounding area.

6. The minimum size for new parcels created for commercial uses within a Rural Center shall be based upon the site requirements (sewerage, parking, building size, etc.) for the proposed use. Parcel size shall be determined by the local government on a case-by-case basis.

7. The minimum size for new parcels created for residential uses within a Rural Center shall be 1 acre.

   To encourage the efficient use of land, provide public amenities and standards for quality developments, and reduce the cost of providing services within Rural Centers, local governments may allow a minimum parcel size of less than 1 acre within Rural Centers if a planned unit development approach is used for the subject parcel, incorporating features such as consolidated access and commonly shared open areas.

8. Commercial uses located outside Urban Areas and Rural Centers shall be limited to a scale that serves local community and tourist needs.

9. Travelers' accommodations, including bed and breakfast inns, may be allowed in Rural Centers and Commercial designations. Bed and breakfast inns may be located in 5-acre Residential and 10-acre Residential designations. Historic dwellings located outside the Rural Centers, Commercial, 5-acre Residential, and

10-acre Residential designations may be considered for use as bed and breakfast inns.

10. Proposed projects should be encouraged to follow planned unit development approaches, featuring consolidated access, commonly shared landscaped open areas, etc.

GMA Guidelines

Uses Allowed Outright: Rural Centers and Commercial Designations

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Rural Center and Commercial.

Uses Allowed through the Expedited Development Review Process: Rural Centers and Commercial Designations

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Rural Center and Commercial.

Review Uses: Rural Centers

1. The following uses may be allowed within Rural Centers, subject to compliance with guidelines for the protection of scenic, cultural, natural, and recreation resources:

    A. One single-family dwelling per legally created parcel.

    B. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.C below.

    C. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel are subject to the following additional standards:

        (1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

        (2) The height of any individual accessory building shall not exceed 24 feet.

D. The temporary use of a mobile home in the case of a family hardship, subject to guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

E. Duplexes.

F. Fire stations.

G. Libraries.

H. Government buildings.

I. Community centers and meeting halls.

J. Schools.

K. Accredited childcare centers.

L. Rural service commercial and tourist commercial uses limited to 5,000 square feet of floor area per building or use.

(1) Grocery stores.

(2) Variety and hardware stores.

(3) Shops, offices, and repair shops.

(4) Personal services such as barber and beauty shops.

(5) Travelers' accommodations, bed and breakfast inns.

(6) Restaurants.

(7) Taverns and bars.

(8) Gas stations.

(9) Gift shops.

M. Home occupations or cottage industries in an existing residence or accessory structure, subject to guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines).

N. Utility facilities and railroads.

O. Recreation development, subject to the guidelines established for recreation intensity classes (Part I, Chapter 4: Recreation Resources).

P. Places of worship.

Q. New cultivation, subject to compliance with guidelines for the protection of cultural resources (Part I, Chapter 2: Cultural Resources) and natural resources (Part I, Chapter 4: Natural Resources).

R. Land divisions, subject to the land use policies in this chapter for minimum parcel sizes.

S. Lot line adjustments that would result in the potential to create additional parcels through subsequent land divisions, subject to the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

T. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

U. Agricultural structures, except buildings, in conjunction with agricultural use.

V. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

W. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

X. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

Y. Commercial events, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

Z. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

Review Uses: Commercial Designations

1. The following uses may be allowed on lands designated Commercial, subject to compliance with the guidelines for protection of scenic, cultural, natural, and recreation resources and "Approval Criteria for Specified Review Uses," below.

A. Travelers' accommodations, bed and breakfast inns.

B. Restaurants.

C. Gift shops.

D. Home occupations or cottage industries in an existing residence or accessory structure, subject to guidelines in "Home Occupations and Cottage Industries" (Part II, Chapter 7: General Policies and Guidelines).

E. One single-family dwelling per legally created parcel.

F. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed as accessory buildings larger than 200 square feet in area or 10 feet in height.

G. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel, subject to the following standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

H. Utility facilities and railroads.

I. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

J. Lot line adjustments that would result in the potential to create additional parcels through subsequent land divisions, subject to the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

K. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

L. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

M. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

N. Commercial events, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

O. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

Approval Criteria for Specified Review Uses

1. The uses identified under "Review Uses: Commercial Designations" may be allowed only if they meet the following two criteria:

   A. The proposal is limited to 5,000 square feet of floor area per building or use.

   B. The proposed use would be compatible with the surrounding area. Review for compatibility shall include impacts associated with the visual character of the area; traffic generation; and noise, dust and odors.

CHAPTER

6

Recreation Designations

This chapter contains land use policies and guidelines for lands designated Public Recreation and Commercial Recreation. Recreation uses may also be authorized in other land use designations. The guidelines in Part I, Chapter 4: Recreation Resources apply to all resource-based recreation uses; the guidelines in this chapter apply to uses located in the Public and Commercial Recreation designations.

This chapter is divided into three sections. A section addressing land uses and development actions on lands designated Public Recreation in the GMA is followed by a similar section for lands designated Commercial Recreation in the GMA. These two sections are followed by a section on lands designated Public Recreation in the SMA.

GMA PROVISIONS

PUBLIC RECREATION

GMA Goal

Protect and enhance opportunities for publicly-owned, moderate- and high-intensity resource-based recreation uses on lands most suitable for such uses.

GMA Policies

1. The following lands shall be designated as Public Recreation:

    A. Existing public park and recreation sites providing moderate- and/or high-intensity recreation uses.

    B. Those public lands suitable for moderate- and/or high-intensity recreation uses, where provision of such uses is consistent with adopted policies, plans, and programs of the owning or managing agency.

C. Those privately owned lands most potentially suitable for provision of moderate- and/or high-intensity public recreation uses.

2. Lands shall be considered highly suitable for Public Recreation designation if they possess significant potential for providing two or more of the following opportunities, are readily accessible, and lack hazards or highly sensitive resources:

   A. River access.

   B. Possibility of multiple recreation uses.

   C. Scenic appreciation.

   D. Facilities satisfying a demonstrated public recreation need.

   E. Trailhead.

   F. Enhancement of scenic, natural, and/or cultural resources.

3. Uses other than those providing public recreation opportunities shall be allowed if they do not interfere with existing or approved recreation uses on the subject site or adjacent lands, and do not permanently commit the site to non-recreation uses.

4. Commercial uses shall be allowed if they are part of an existing or approved public recreation use and are consistent with the policies and guidelines contained in this chapter for private concessions and commercial uses at recreation sites.

GMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Public Recreation.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Public Recreation.

Review Uses

1. The following uses may be allowed on lands designated Public Recreation, subject to compliance with guidelines for the protection of scenic, natural, cultural, and recreation resources and compliance with numbers 1.A, 1.C, 1.D, 1.E, 1.F, and 1.G

(where applicable) of the "Approval Criteria for Recreation Uses" contained in the recreation intensity class guidelines (Part I, Chapter 4: Recreation Resources):

A. Publicly-owned, resource-based recreation uses, consistent with recreation intensity class policies and guidelines (Part I, Chapter 4: Recreation Resources).

B. Commercial uses and non-resource based recreation uses that are part of an existing or approved resource-based public recreation use, consistent with the policies, guidelines, and conditional use criteria for such uses contained in this section.

C. New cultivation, subject to compliance with guidelines for the protection of cultural resources (Part I, Chapter 2: Cultural Resources) and natural resources (Part I, Chapter 4: Natural Resources).

D. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

2. The following uses may be allowed on lands designated Public Recreation, subject to compliance with the "Approval Criteria for Non-Recreation Uses in Public Recreation designations," below, and the guidelines for the protection of scenic, natural, cultural, and recreation resources:

A. One single-family dwelling for each parcel legally created prior to adoption of the Management Plan. Exceptions may be considered only upon demonstration that more than one residence is necessary for management of a public park.

B. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 2.C below.

C. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

D. Agricultural structures, except buildings, in conjunction with agricultural use.

E. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

F. Utility transmission, transportation, communication, and public works facilities.

G. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

H. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

I. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

J. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

K. Commercial events, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

3. Land divisions may be allowed, subject to compliance with criterion 1.C under "Approval Criteria for Non-Recreation Uses in Public Recreation," below.

4. Lot line adjustments may be allowed, subject to compliance with the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

Approval Criteria for Non-Recreation Uses in Public Recreation

1. The uses identified under Guidelines 2 and 3 under "Review Uses," above, may be allowed if they meet the following criteria:

   A. The proposed use will not interfere with existing or approved public recreation uses on the subject property or adjacent lands. Mitigative measures used to comply with this criterion may include provision of onsite buffers, seasonal or temporary closures during peak recreation use periods, etc.

   B. The proposed use will not permanently commit the majority of the site to a non-recreational use. Careful siting and design of structures and other improvements may be used to comply with this criterion.

C. Land divisions may be allowed upon a demonstration that the proposed land division is necessary to facilitate, enhance, or otherwise improve recreational uses on the site.

COMMERCIAL RECREATION

GMA Goal

Protect and enhance opportunities for commercially owned, resource-based recreation and supporting commercial uses on lands containing such existing uses or lands on which such proposed uses have been deemed consistent with the Scenic Area Act.

GMA Policies

1. Those lands devoted to resource-based, commercial recreation uses and those lands highly suitable for such uses shall be designated as Commercial Recreation.

2. Lands may be considered highly suitable for Commercial Recreation uses if they have the following characteristics:

   A. The site offers an outstanding opportunity for active, resource-based, river-oriented recreation or a unique opportunity for some other type of active, resource-based recreation. Examples of such opportunities and uses include: access (e.g. swimming, windsurfing, boating, and picnicking) to the Columbia River or its major tributaries; access to an outstanding sport fishery on the main stem of the Columbia River or a major tributary; access to the only natural hot springs in the Scenic Area (uniqueness criterion); etc.

   B. The site is classified in the Management Plan for moderate- or high-intensity recreation (Recreation Intensity Class 3 or 4 as defined in Part I, Chapter 4: Recreation Resources).

   C. Potential development on the site would not adversely affect sensitive wildlife habitat or plants, wetlands, or aquatic or riparian areas. This may be achieved by either designing the development to avoid areas containing such resources or by applying mitigation measures that reduce effects on such resources to less than adverse levels.

   D. Potential development on the site would not adversely affect significant cultural resources. This may be achieved by either designing the development to avoid areas containing such resources or by applying mitigation measures that reduce effects to such resources to less than adverse levels.

   E. Potential development on the site would not have cumulative adverse effects upon scenic, cultural, natural or recreation resources, considering other

development (existing or authorized in the Management Plan) in the Scenic Area or in the vicinity of the development.

3. Overnight accommodations (in addition to campgrounds) shall be allowed if they are rural in scale, such as cabins or cottages, and are closely associated with resource-based recreation opportunities located onsite or on adjacent lands that are accessed through the site. This policy shall not apply to a recreation resort. *(Revised: CRGC adopted 7/7/08; U.S. Sec. Ag. concurrence 10/8/08)*

4. Uses other than those providing commercially owned, resource-based recreation opportunities shall be allowed if they do not interfere with existing or approved recreation uses on the subject site or adjacent lands and do not permanently commit the site to non-recreational uses.

5. Commercial uses (such as restaurants) shall be allowed if they are part of an existing or approved commercial recreation use and are consistent with the policies and guidelines for private concessions and commercial uses at recreation sites contained in this chapter.

6. Redevelopment of an existing industrial complex as a recreation resort may be allowed if the result is protection of and enhancement to scenic, cultural, natural and recreation resources, and protection of tribal treaty rights. All uses must be part of an approved master plan and consistent with the policies and guidelines for recreation resorts contained in this chapter. *(Added: CRGC adopted 7/7/08; U.S. Sec. Ag concurrence 10/8/08)*

   A. The overall scale of a resort shall be limited to ensure the resort protects and supports the economies of urban areas and protects scenic area resources. The total number of resort users shall be roughly equivalent to what is otherwise allowed in the designation.

   B. All existing industrial uses shall be extinguished. All structures associated with the existing industrial complex that are not reused or restored for adaptation to resort use shall be removed. Existing residential uses may remain.

   C. Recreation uses (including campgrounds) consistent with the recreation intensity class guidelines associated with the recreation resort may extend to contiguous and adjacent lands under other land use designations if consistent with the adjacent land use designation and the recreation intensity class policies and guidelines. All recreation development shall be included in the resort master plan.

   D. All accommodation units shall be designed for, and uses limited to, short-term occupancy to ensure the resort protects and supports the economies of urban areas.

   E. Commercial uses shall be limited to ensure the resort protects and supports the

economies of urban areas. Commercial uses shall be oriented toward serving resort guests and recreation site users rather than the traveling public.

F. The general scale (height, dimensions and overall mass) of buildings in the resort core may be compatible with the scale of the buildings located within the existing industrial complex prior to redevelopment as a recreation resort.

H. The recreation resort shall be compatible with the surrounding areas.

GMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Commercial Recreation.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Commercial Recreation.

Review Uses

1. The following uses may be allowed on lands designated Commercial Recreation, subject to compliance with guidelines for the protection of scenic, natural, cultural and recreation resources and compliance with numbers 1.A, 1.C, 1.D, 1.E, 1.F, and 1.G (where applicable) of the "Approval Criteria for Recreation Uses" contained in the recreation intensity class guidelines (Part I, Chapter 4: Recreation Resources):

   A. Commercially owned, resource-based recreation uses, consistent with recreation intensity class policies and guidelines (Part I, Chapter 4: Recreation Resources).

   B. Overnight accommodations that are part of a commercially owned, resource-based recreation use, where such resource-based recreation use occurs on the subject site or on adjacent lands that are accessed through the site, and that meet the following standards:

      (1) Buildings containing individual units shall be no larger than 1,500 square feet in total floor area and no higher than 2-1/2 stories.

(2) Buildings containing more than one unit shall be no larger than 5,000 square feet in total floor area and no higher than 2-1/2 stories.

(3) The total number of individual units shall not exceed 25, unless the proposed development complies with standards for clustered accommodations in subsection (4) of this guideline.

(4) Clustered overnight travelers accommodations meeting the following standards may include up to 35 individual units:

(a) Average total floor area of all units is 1,000 square feet or less per unit.

(b) A minimum of 50 percent of the project site is dedicated to undeveloped, open areas (not including roads or parking areas).

(c) The facility is in an area classified for high-intensity recreation (Recreation Intensity Class 4).

C. Commercial uses, including restaurants sized to accommodate overnight visitors and their guests, and non-resource based recreation uses that are part of an existing or approved resource-based commercial recreation use, consistent with the policies, guidelines, and conditional use criteria for such uses contained in this section.

D. New cultivation, subject to compliance with guidelines for the protection of cultural resources (Part I, Chapter 2: Cultural Resources) and natural resources (Part I, Chapter 4: Natural Resources).

E. Special uses in historic buildings, subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines).

2. The following uses may be allowed on lands designated Commercial Recreation, subject to compliance with the "Approval Criteria for Non-Recreational Uses in Commercial Recreation," below, and the guidelines for the protection of scenic, natural, cultural, and recreation resources:

A. One single-family dwelling for each lot or parcel legally created prior to adoption of the Management Plan.

B. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 2.C below.

C. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel are subject to the following additional standards:

(1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

(2) The height of any individual accessory building shall not exceed 24 feet.

D. Agricultural structures, except buildings, in conjunction with agricultural use.

E. Agricultural buildings in conjunction with current agricultural use and, if applicable, proposed agricultural use that a landowner would initiate within one year and complete within five years, subject to the standards in "Agricultural Buildings" (Part II, Chapter 7: General Policies and Guidelines).

F. Utility transmission, transportation, and communication facilities.

G. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

H. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

I. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

J. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

K. Commercial events, subject to the guidelines in "Commercial Events" (Part II, Chapter 7: General Policies and Guidelines).

3. Land divisions may be allowed, subject to compliance with criterion 1.C under "Approval Criteria for Non-Recreational Uses in Commercial Recreation," below.

4. Lot line adjustments may be allowed, subject to compliance with the guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines).

5. Recreation resorts may be allowed on lands designated Commercial Recreation that include an existing industrial complex, subject to compliance with the following

approval criteria, and the guidelines for the protection of scenic, natural, cultural, and recreation resources. All uses on lands with an approved recreation resort shall be subject to the following limitations: *(Added: CRGC adopted 7/7/08; U.S. Sec. Ag. concurrence 10/8/08)*

A. Uses Allowed: All commercial development (except for privately owned, public use resource-based recreation uses) and accommodations within a recreation resort shall be located within the resort core. Recreation facilities associated with the recreation resort shall be included on the resort master plan and may extend to contiguous and adjacent lands under other land use designations only if consistent with the land use designation and the recreation intensity class policies and guidelines (Part I, Chapter 4: Recreation Resources).

(1) Accommodations that are part of a recreation resort shall meet the following standards:

(a) The total number of accommodation units and campground sites shall not exceed that approved by the resort master plan.

(b) The average size of accommodation units shall not exceed 1,300 square feet. Individual accommodation units shall be no larger than 1,600 square feet in total floor area.

(c) No unit shall contain more than one kitchen.

(d) Parking shall be predominantly in common lots or structures and accessed through shared driveways. Individual accommodation units shall not have separate or attached garages.

(e) All accommodation units shall have design and use restrictions that effectively limit their use to short-term occupancy and that require occupancy to be limited to no more than 45 days in any 90 day period.

(2) Commercial uses that are part of a recreation resort shall meet the following standards:

(a) Commercial uses shall be located predominantly within and oriented internally toward the center of the resort core or to serve adjacent recreation areas, rather than at or toward the resort perimeter.

(b) Commercial uses are limited to restaurants and pubs, a mini-mart, recreation equipment rental, and other small-scale retail and guest services. Conference and meeting facilities may be permitted.

(c) Gas stations, banks, grocery stores, or other services commonly found in urban areas or catering to the traveling public shall not be permitted.

(d) Commercial uses shall be sized and oriented to primarily serve resort guests and recreation-site users rather than the traveling public.

(3) Notwithstanding GMA Guideline 2 of the GMA Overall Scenic Provisions, new recreation resort buildings located within the resort core may be compatible with the general scale (height, dimensions and overall mass) of industrial buildings that existed within the existing industrial complex.

(a) The cumulative footprint of all recreation resort buildings located within the resort core shall not exceed that of buildings located within the existing industrial complex at the time of application.

(b) Buildings shall not exceed 2-1/2 stories in height.

(4) Land divisions for the purpose of selling individual accommodation units shall not be permitted within the resort core.

B. Application for a recreation resort shall include the following materials in addition to those required large-scale review uses by Part I: Resource Protection and Enhancement:

(1) A master plan including the contents listed in subsection C(1), below. The master plan shall include all areas where recreational, commercial, and resort uses are proposed and where mitigation and enhancement measures are planned or necessary.

(2) A traffic impact study meeting the applicable local or state department of transportation standards that projects future conditions for each phase and after the project is completed.

(3) A description of economic impacts of resort development prepared by a qualified economist that includes:

(a) Assessment of effects on public services and emergency response needs.

(b) Assessment of net economic effect on surrounding communities and counties that takes into account public services costs, job creation, effect on tax base, and commercial activity in nearby urban areas.

(4) An engineering assessment of impact on community water facilities and surface water quality due to projected water use and treatment methods at resort build-out.

(5) Assessment of effects on existing recreation resources at and adjacent to the resort that evaluates:

(a) Types of recreation resources and levels of current use.

(b) Existing site conditions and recreation site capacity, including parking, safety, river access, and on-river conditions.

(c) Projected additional use and effect on existing recreation areas due to recreation resort development, by phase and at full build-out.

(d) Potential effect on the quality of the recreation experience at adjacent recreation sites; including effects due to potential changes in parking, traffic, public health and safety due to recreation resort development.

(e) Identification of potential mitigation and enhancement actions that would improve the quality of the experience for current and projected levels of use.

(6) Assessment of effect on surrounding areas. Review of impacts at a minimum shall include the visual character of the area, traffic generation, emergency response, fire risk and lighting.

(7) A delineation of the boundary of the existing industrial complex, and an inventory of existing development within the complex, including the dimensions and locations of all buildings.

C. All development within the recreation resort shall be based on a master plan. Master plans shall be sufficiently detailed to enable the reviewing agency to confirm the guidelines of this section will be met through the development.

(1) The resort master plan shall include:

(a) Land use plan: This shall designate uses for all areas within the development. This shall also include a delineation of the resort core.

(b) Building design plan: This shall describe the location, materials, colors, and dimensions of all structures proposed.

(c) Landscape plan: This shall identify all areas where existing vegetation is to be removed and retained, and describe proposed landscape plantings, species and size of plants used, as well as irrigation and landscape maintenance plans.

(d) Traffic circulation plan: This shall describe all road way and parking locations, widths, and surfacing materials.

(e) Roadway improvement plan: This shall describe all on-site and off-site improvements necessary to mitigate traffic impacts and enhance driver and pedestrian safety in the vicinity of the resort.

(f) Grading and drainage plan: This shall indicate existing and proposed contours throughout the redevelopment area. Stormwater drainage routes and facilities shall also be indicated on this plan.

(g) Infrastructure development plan: This shall describe the location, size, basic design, funding mechanisms, and operational plans for water, sewer, power, and emergency services.

(h) Construction phasing plan: This shall indicate intended phasing of development of the project, if any, including anticipated initiation and completion dates for each component of the development. This shall also discuss how the project will function at interim stages prior to completion of all phases, and how the resort may operate successfully and meet its resource protection and enhancement commitments should development cease before all phases are completed.

(i) Resource protection and enhancement plan: This shall describe and indicate proposed measures that will be implemented to protect and enhance scenic, natural, cultural and recreation resources, including measures necessary to mitigate impacts identified through assessments required by this section.

(2) Reviewing agencies shall develop procedures for master plan and phase approval, time extension, and revision consistent with the following:

(a) Construction of all phases of the master plan shall be completed within 12 years from the date of approval. A reviewing agency may grant one extension of time, not to exceed three years, to the validity of the master plan if it determines that events beyond the control of the applicant prevented completion of all phases of the master plan.

(b) The initial phase of the master plan shall be commenced within 3 years of master plan approval by the reviewing agency. The reviewing agency may approve one extension of time, not to exceed two years, to initiate the initial phase if it determines that events beyond the control of the applicant prevented commencement of the phase.

(c) The reviewing agency shall review each phase of the master plan for consistency with the master plan prior to any construction on that phase. The review for consistency shall be an administrative decision. Each phase of the master plan shall be completed within

three years from the date the reviewing agency determines that phase is consistent with the master plan. The reviewing agency may grant one extension of time, not to exceed two years, if it determines that events beyond the control of the applicant prevented completion of that phase.

(d) The reviewing agency may approve minor changes to the findings, conclusions, and conditions of approval for master plans and phases if the change is deemed to be consistent with the guidelines of this section and does not generate new significant potential impacts not previously addressed in the original review. Approval or denial of a request for a minor change or extension shall be an administrative decision.

D. Development Standards: The applicant shall demonstrate and the reviewing agency shall make findings that determine the following standards are met through development under the approved master plan for the recreation resort:

(1) Master Plan:

(a) Removal: The first phase of recreation resort development shall result in the elimination of industrial uses and removal of all portions of the industrial complex that are not planned for use as part of the resort. Existing residential uses may remain.

(b) Infrastructure: The recreation resort shall provide its own sewer, water and internal circulation system, including roads. The development shall accommodate mass transportation to access the site and adjacent recreation areas.

(c) On-site and off-site infrastructure impacts shall be fully considered and mitigated. Mitigation may include assessment of impact fees, provision of community facilities within or adjacent to the resort. The reviewing agency may require that some or all reasonable and negotiated costs, expenses or charges associated with the alteration, construction or improvement of public services and facilities shall be the responsibility of the applicant.

(d) Phasing: Each phase shall be self-sufficient, in conjunction with existing elements of the resort. Transportation, parking, utilities, landscaping, as well as recreation mitigation and enhancements for each phase shall be satisfied within each phase and shall not be dependent upon a future phase.

(i) Each phase of the development shall be designed to be completed within two years of the commencement of construction

for that phase.

(ii) Off-site recreation mitigation and enhancement shall be included in the first phase and completed prior to occupancy of resort buildings and initiation of a second phase.

(iii) On-site recreation mitigation and enhancement shall be developed in proportion to the type and amount of development in each phase.

(e) Landscaping necessary to screen development from key viewing areas shall be sized to provide sufficient screening to make development of each phase visually subordinate within 5 years or less from the commencement of construction of that phase, except for landscaping necessary to screen development from the section of SR 14 passing through the resort core. Such landscaping may be sized to provide sufficient screening to make development visually subordinate within 10 years from the commencement of construction of each phase. Landscaping for each phase shall be installed as soon as possible and prior to phase completion.

(f) Bonding sufficient to ensure remediation and clean up of the site and completion of resource enhancements identified in the master plan is required.

(2) Potentially adverse impacts of a recreation resort on surrounding areas shall be mitigated.

(a) Traffic, safety, and circulation impacts shall be mitigated in conformity with reviewing agency requirements. For each phase of the proposed development, the developer shall make road and intersection improvements to maintain traffic levels of service existing prior to each phase. The developer shall ensure that in no event may it cause the public road system to operate below a level-of-service (LOS) C for intersection delay during the peak traffic hour. LOS C standards shall be determined based on the most recently adopted version of the Highway Capacity Manual (Transportation Research Board).

(b) Reviewing agencies may apply additional restrictions on noise, odor, lighting and water treatment in order to mitigate identified impacts.

(3) Recreation resources on the subject property shall be protected and enhanced by the development of the recreation resort. Recreation resources on adjacent lands and nearby areas shall be protected.

(a) Potentially adverse impacts to adjacent recreation sites due to the development shall be mitigated.

(b) Recreation enhancements shall include, but are not limited to, measures that address existing site conditions and provide new or expanded facilities that are open to the public.

(c) Resource protection and enhancement plans shall address at a minimum:

(i) Improvements to recreation user areas.

(ii) New or improved access to recreation sites.

(iii) Parking improvements and other potential methods to reduce parking demand at adjacent recreation sites by resort guests, such as shuttles or parking restrictions.

(iv) Cooperative agreements with the management of adjacent recreation sites to jointly address potential adverse impacts.

(v) Establishment of mitigation funds to be applied to improvements at public recreation sites.

(vi) Development of secondary activities, such as spectator seating, development of recreational trials, interpretation sites and trails.

(4) Scenic resources shall be protected and enhanced by the development of the recreation resort. All new development, including additions or re-use of existing structures for resort use shall be visually subordinate as seen from key viewing areas. Enhancements may include, but are not limited to: removal of visually discordant structures and building materials not associated with the existing industrial complex, grading and vegetative restoration of previously disturbed areas and permanent protection of undeveloped lands in the master plan area or adjoining lands in the same ownership.

(5) Cultural resources shall be protected and enhanced by development of the recreation resort. Cultural resource reconnaissance survey procedures and standards for large-scale uses are applicable to recreation resort development. Enhancements may include, but are not limited to, interpretive displays, restoration or adaptive re-use of historical structures.

(6) Natural resources shall be protected and enhanced by the development of the recreation resort. Enhancements may include, but are not limited to, habitat improvements, permanent protection of undeveloped lands, water-quality improvements.

(7) Tribal treaty rights shall be protected by development of the recreation resort. Protection requires determination that the policies for River Access and Protection of Treaty Rights in Part I, Chapter 4 have been met by the application and development plan.

Approval Criteria for Non-Recreational Uses in Commercial Recreation

1. The uses identified under Guidelines 2 and 3 under "Review Uses," above, may be allowed if they meet the following criteria:

   A. The proposed use will not interfere with existing or approved commercial recreation uses on the subject property or adjacent lands. Mitigative measures used to comply with this criterion may include provision of onsite buffers, seasonal or temporary closures during peak recreation use periods, etc.

   B. The proposed use will not permanently commit the majority of the site to a non-recreational use. Careful siting and design of structure and other improvements may be used to comply with this criterion.

   C. Land divisions may be allowed upon a demonstration that the proposed land division is necessary to facilitate, enhance, or otherwise improve recreational uses on the site.

SMA PROVISIONS

PUBLIC RECREATION

SMA Goal

Protect and enhance lands that are suitable for public recreation.

SMA Policies

1. Public recreation shall be natural resource based.
2. All existing developed public recreation sites providing moderate- and/or high-intensity uses shall be designated as Public Recreation.
3. Recreation development shall meet the guidelines set forth in Part I, Chapter 4: Recreation Resources.
4. All new land uses and developments shall protect the scenic, natural, cultural, and recreation resources.
5. Opportunities for moderate and intensive natural resource-based recreation development shall be protected by applying a Public Recreation designation.
6. No new dwellings shall be permitted on parcels of less than 40 contiguous acres.
7. Dwellings shall only be allowed when they meet the conditions described for Agricultural Land (Part II, Chapter 1) or Forest Land (Part II, Chapter 2), or when they are shown to be necessary for public recreation site management purposes.
8. New commercial recreation facilities shall not be permitted.
9. All National Forest System lands shall be subject to the laws and regulations pertaining to the National Forest system, including the National Environmental Policy Act (NEPA), the Mt. Hood National Forest Land and Resource Management Plan, and the Gifford Pinchot National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan. The most protective standards of the National Scenic Area Management Plan or the respective Forest Land and Resource Management Plans (as amended by the Northwest Forest Plan) shall apply to National Forest System lands.

SMA Guidelines

Uses Allowed Outright

1. The uses listed in "Uses Allowed Outright, All Land Use Designations, Except Open Space and Agriculture-Special" (Part II, Chapter 7: General Policies and Guidelines) are allowed without review on lands designated Public Recreation.

Uses Allowed through the Expedited Development Review Process

1. The uses listed in "Expedited Development Review Process" (Part II, Chapter 7: General Policies and Guidelines) are allowed with review through the expedited development review process on lands designated Public Recreation.

Review Uses

1. The following uses may be allowed on lands designated Public Recreation subject to review for compliance with scenic, cultural, natural, and recreational resources guidelines:

   A. Forest uses and practices, as allowed for in Part II, Chapter 2: Forest Land, except Forest Land Review Uses 1. I, 1.L, 1.M, and 1.V.

   B. Public trails, consistent with the provisions in Part I, Chapter 4: Recreation Resources.

   C. Public recreational facilities, consistent with the provisions in Part I, Chapter 4: Recreation Resources.

   D. Public nonprofit group camps, retreats, conference or educational centers, and interpretive facilities.

   E. One single-family dwelling on a parcel of 40 contiguous acres or larger when it meets the conditions described for Agricultural Land (Part II, Chapter 1) or Forest Land (Part II, Chapter 2), or when shown to be necessary for public recreation site management purposes**.**

   F. Accessory structures for an existing or approved dwelling that are not otherwise allowed outright, eligible for the expedited development review process, or allowed in Guideline 1.G below.

   G. Accessory building(s) larger than 200 square feet in area or taller than 10 feet in height for a dwelling on any legal parcel are subject to the following additional standards:

      (1) The combined footprints of all accessory buildings on a single parcel shall not exceed 1,500 square feet in area. This combined size limit refers to all accessory buildings on a parcel, including buildings allowed without review, existing buildings and proposed buildings.

      (2) The height of any individual accessory building shall not exceed 24 feet.

   H. Home occupation and cottage industries, as specified in Part II, Chapter 7: General Policies and Guidelines.

I. Resource enhancement projects for the purpose of enhancing scenic, cultural, recreation and/or natural resources, subject to the guidelines in "Resource Enhancement Projects" (Part II, Chapter 7: General Policies and Guidelines). These projects may include new structures (e.g., fish ladders, sediment barriers) and/or activities (e.g., closing and revegetating unused roads, recontouring abandoned quarries).

J. Road and railroad construction and reconstruction.

K. Utility facilities for public service upon a showing that:

(1) There is no alternative location with less adverse effect on Public Recreation land.

(2) The size is the minimum necessary to provide the service.

L. Agricultural review uses, as allowed for in Part II, Chapter 1: Agricultural Land, except Agricultural Land Review Uses 1.H, 1.I, 1.T, and 1.AA.

M. On a parcel of 40 acres or greater with an existing dwelling, the temporary use of a mobile home in the case of a family hardship, subject to the guidelines for hardship dwellings in "Temporary Use - Hardship Dwelling" (Part II, Chapter 7: General Policies and Guidelines).

N. Additions to existing buildings greater than 200 square feet in area or greater than the height of the existing building.

O. Removal/demolition of structures that are 50 or more years old**,** including wells, septic tanks and fuel tanks.

P. Docks and boathouses, subject to the guidelines in "Docks and Boathouses" (Part II, Chapter 7: General Policies and Guidelines).

CHAPTER

7

General Policies and Guidelines

The policies and guidelines in this chapter provide more detailed guidance for uses authorized in many (or all) designations, as well as for uses which either are exempt from regulation under the Scenic Area Act, or allowed without a Scenic Area review.

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SAVINGS POLICIES

These policies repeat and respond to direction in the Scenic Area Act that the Management Plan not affect certain uses that take place in the Scenic Area.

1. The Gorge Commission and Forest Service shall, in the Management Plan and in the implementation actions, protect treaty and other rights of Indian tribes. Nothing in the plan may interfere with the exercise of those rights.

2. Lands held in trust by the Secretary of the Interior for Indian tribes or for individual members of Indian tribes, and lands acquired by the U.S. Army Corps of Engineers and administered by the Secretary of the Interior for the benefit of Indian tribes or of individual members of Indian tribes, shall be exempt from regulation under the Management Plan or land use ordinances adopted by counties or the Gorge Commission pursuant to the Scenic Area Act. This exemption shall extend to lands selected by the U.S. Army Corps of Engineers as "in lieu" fishing sites pursuant to Public Law 100-581 before or after the effective date of the Management Plan. For those "in lieu" sites chosen after the effective date of the Management Plan, the exemption shall commence upon selection by the U.S. Army Corps of Engineers.

3. Rights to surface or ground water shall be exempt from regulation under the Management Plan or land use ordinances adopted by counties or the Gorge Commission pursuant to the Scenic Area Act.

4. Water transportation activities on the Columbia River or its tributaries shall be exempt from regulation under the Management Plan or land use ordinances adopted by counties or the Gorge Commission pursuant to the Scenic Area Act. The term "activities" includes those facilities necessary for navigation.

5. The operation, maintenance, and modification of existing transmission facilities of the Bonneville Power Administration shall be exempt from regulation under the Management Plan or land use ordinances adopted by the counties or the Gorge Commission pursuant to the Scenic Area Act.

6. Neither the Management Plan nor land use ordinances adopted by counties or the Gorge Commission pursuant to the Scenic Area Act may affect laws, rules, or regulations pertaining to hunting or fishing.

7. Neither the Forest Service nor the Gorge Commission may establish any buffer zones or protective perimeters outside the boundaries of the Scenic Area.

8. The operation, maintenance, and improvement of navigation facilities at Bonneville Dam pursuant to federal law, except for the offsite disposal of excavation material, shall be exempt from regulation under the Management Plan or land use ordinances adopted by counties or the Gorge Commission under the Scenic Area Act.

9. In the GMA, the rights and responsibilities of non-federal timber landowners under the Forest Practices Acts of Washington and Oregon, or under county regulations that supersede those acts, shall be exempt from regulation under the Management Plan or land use ordinances adopted by counties or the Gorge Commission pursuant to the Scenic Area Act.

STANDARDS FOR APPLICATIONS, EXPIRATION OF APPROVALS, VESTED RIGHTS

GMA/SMA Guidelines

Standards for Applications

1. Complete Application Required: Any proposed use, development or structure shall be reviewed according to the standards in effect on the date an applicant submitted a complete land use application to the reviewing agency. A complete application is one that the reviewing agency determines meets the Management Plan's requirements for: (1) a complete application form, (2) a complete site plan, and (3) all applicable information specified in the parts of the Management Plan titled Resource Protection and Enhancement, Land Use Designations, and Indian Tribal Treaty Rights and Consultation. Incomplete applications shall not be reviewed.

Expiration of Approvals

1. Notice Not Required: Expiration of any land use approval issued pursuant to this Management Plan shall be automatic. Failure to give notice of expiration shall not affect the expiration of a land use approval.

2. Land Use Approvals without Structures: Any land use approval issued pursuant to this Management Plan for a use or development that does not include a structure shall expire two years after the date the land use approval was granted, unless the use or development was established according to all specifications and conditions of approval in the land use approval. For land divisions, "established" means the final deed or plat has been recorded with the county recorder or auditor.

3. Land Use Approvals with Structures**:** Any land use approval issued pursuant to this Management Plan for a use or development that includes a structure shall expire as follows:

    A. When construction has not commenced within two years of the date the land use approval was granted, or

    B. When the structure has not been completed within two years of the date of commencement of construction.

4. Commencement of Construction: As used in 3.A above, commencement of construction shall mean actual construction of the foundation or frame of the approved structure. For utilities and developments without a frame or foundation, commencement of construction shall mean actual construction of support structures for an approved above ground utility or development or actual excavation of trenches for an approved underground utility or development. For roads, commencement of construction shall mean actual grading of the roadway.

5. Completion of Structure: As used in 3.B above, completion of the structure shall mean (1) completion of the exterior surface(s) of the structure and (2) compliance with all conditions of approval in the land use approval.

6. Extension of Validity of Land Use Approvals: A request for extension of the time frames in Guidelines 2, 3.A or 3.B, above, shall be submitted in writing before the applicable expiration date.

   A. A reviewing agency may grant one 12-month extension to the validity of a land use approval if it determines that events beyond the control of the applicant prevented commencement of the use or development (applicable to 2 above) or commencement of construction (applicable to 3.A above) within the original two-year time frame.

   B. An agency may also grant one 12-month extension if it determines that events beyond the control of the applicant prevented completion of the structure (applicable to 3.B above) within the original two-year time frame.

   C. A request for extension shall state the reason why events beyond the control of the applicant warrant an extension.

   D. Approval or denial of a request for extension shall be considered an administrative decision.

7. Vested Rights: The laws of the states of Oregon and Washington concerning vested rights shall not apply in the National Scenic Area. A person has a vested right for as long as the land use approval does not expire.

EXISTING USES AND DISCONTINUED USES

GMA/SMA Guidelines

1. Right to Continue Existing Uses and Structures: Except as otherwise provided, any existing use or structure may continue as long as it is used in the same manner and for the same purpose.

2. Replacement of Existing Structures Not Damaged or Destroyed by Disaster: Except as provided in Guideline 3 below, an existing structure may be replaced if a complete land use application for a replacement structure is submitted to the reviewing agency within one year of the date the use of the original structure was discontinued. The replacement structure shall comply with the following standards:

   A. The replacement structure shall be used in the same manner and for the same purpose as the original structure.

   B. The replacement structure may have a different size and/or location than the original structure. An existing mobile home may be replaced with a framed residence and an existing framed residence may be replaced with a mobile home.

   C. The replacement structure shall be subject to the scenic, cultural, recreation and natural resources guidelines; the treaty rights guidelines; and the land use designations guidelines involving agricultural buffer zones, approval criteria for fire protection, and approval criteria for siting of dwellings on forest land.

   D. The original structure shall be considered discontinued if a complete land use application for a replacement structure is not submitted within the one year time frame.

3. Replacement of Existing Structures Damaged or Destroyed by Disaster: An existing structure damaged or destroyed by fire, flood, landslide or other similar disaster may be replaced if a complete land use application for a replacement structure is submitted to the reviewing agency within two years of the date the original structure was damaged or destroyed. The replacement structure shall comply with the following standards:

   A. The replacement structure shall be used in the same manner and for the same purpose as the original structure. An existing mobile home may be replaced with a framed residence.

   B. The replacement structure shall be in the same location as the original structure. An exception may be granted and the replacement structure may be sited in a different location if the following conditions exist:

      (1) A registered civil engineer, registered geologist, or other qualified and licensed professional hired by the applicant demonstrates the disaster made the original building site physically unsuitable for reconstruction.

      (2) The new building site is no more visible from key viewing areas than the original building site. An exception may be granted if a registered civil engineer, registered geologist, or other qualified and licensed professional hired by the applicant demonstrates the subject parcel lacks alternative

building sites physically suitable for construction that are no more visible from key viewing areas than the original building site.

(3) The new building site complies with the cultural resources, natural resources, and treaty rights protection guidelines.

C. The replacement structure shall be the same size and height as the original structure, provided:

(1) The footprint of the replacement structure may be up to 10 percent larger than the footprint of the original structure.

(2) The walls of the replacement structure shall be the same height as the walls of the original structure unless a minor increase is required to comply with standards in the current jurisdictional building code.

D. The replacement structure shall only be subject to the following scenic resources standards:

(1) The replacement structure shall comply with the scenic resources guidelines regarding color and reflectivity. These guidelines shall be applied to achieve the applicable scenic standard (visually subordinate or not visually evident) to the maximum extent practicable.

(2) Decks, verandas, balconies and other open portions of the original structure shall not be rebuilt as enclosed (walls and roof) portions of the replacement structure.

(3) In the General Management Area, the replacement structure shall comply with the scenic resources guidelines regarding landscaping. These guidelines shall be applied to achieve the applicable scenic standard (visually subordinate) to the maximum extent practicable, provided:

(a) Except as provided in Guideline 3.D(3)(b) below, the percent of the replacement structure screened by vegetation as seen from key viewing areas shall not exceed the percent of the original structure that was screened by vegetation as seen from key viewing areas. Coniferous vegetation shall be replaced with coniferous vegetation and deciduous vegetation shall be replaced with deciduous vegetation unless the applicant chooses to use all coniferous vegetation.

(b) In situations where the original structure was approved under Scenic Area regulations (e.g., Final Interim Guidelines, land use ordinance), the percent of the replacement structure screened by vegetation shall comply with any conditions of approval that

required a landowner to preserve existing vegetation and/or plant and maintain new vegetation to screen the original structure as seen from key viewing areas.

(c) To help determine how much vegetation may be required under Guidelines 3.D(3)(a) and (b) above, land use applications shall include all available documentation (photographic or otherwise) on the amount and type of vegetation that screened the original structure from key viewing areas. At a minimum, development review decisions shall include findings that address the following:

(i) The percent of original structure facing each key viewing area that was screened by coniferous vegetation, for each key viewing area from which the structure was visible.

(ii) The percent of original structure facing each key viewing area that was screened by deciduous vegetation, for each key viewing area from which the structure was visible.

(iii) Elevation drawings showing the replacement structure and the amount of coniferous and deciduous vegetation that would screen the structure from key viewing areas in 10 years.

(d) The height of any new trees shall not be required to exceed 5 feet.

(e) The time frame for achieving visual subordinance shall be 10 years or less from the commencement of construction.

(4) In the Special Management Area, the replacement structure shall comply with the scenic resources guidelines regarding landscaping. These guidelines shall be applied to achieve the applicable scenic standard (visually subordinate or not visually evident) to the maximum extent practicable, provided:

(a) The *Scenic Resources Implementation Handbook* shall be utilized to determine approvable species and minimum approvable sizes of new trees planted (based on average growth rates expected for approvable species).

(b) The height of any new trees shall not be required to exceed 5 feet.

(c) The time frame for achieving the applicable scenic standard (visually subordinate or not visually evident) shall be 10 years.

E. The replacement structure shall be subject to Guidelines 2.A, 2.B, and 2.C above if it would not comply with Guidelines 3.B and 3.C above.

F. The original structure shall be considered discontinued if a complete land use application for a replacement structure is not submitted within the two year time frame.

4. Changes to Existing Uses and Structures**:** Except as otherwise provided, any change to an existing use or modification to the exterior of an existing structure shall be subject to review and approval pursuant to this Management Plan. *(Revised: CRGC adoption 7/13/10; U.S. Sec. Ag. concurrence 11/1/10 & 7/1/11)*

A. Conversion of Existing Industrial Uses in the GMA: In the GMA, existing industrial uses may convert to less intensive uses. For this section, a less intensive use is a commercial, recreation, or residential use with fewer adverse effects upon scenic, cultural, natural, and recreation resources.

B. Existing Development or Production of Mineral Resources in the GMA: In the GMA, existing development or production of mineral resources may continue unless the Gorge Commission determines that the uses adversely affect the scenic, cultural, natural, or recreation resources of the Scenic Area. These uses will be considered discontinued and subject to land use ordinances under the Management Plan if any of the following conditions exist:

(1) The mined land has been reclaimed naturally or artificially to a point where it is revegetated to 50 percent of its original cover (considering both basal and canopy) or has reverted to another beneficial use, such as grazing. Mined land shall not include terrain that was merely leveled or cleared of vegetation.

(2) The site has not maintained a required state permit.

(3) The site has not operated legally within 5 years before the date of adoption of the Management Plan.

C. Existing Development or Production of Mineral Resources in the SMA: Uses involving the exploration, development, or production of sand, gravel, or crushed rock in the SMA may continue if both of the following conditions exist:

(1) The sand, gravel, or crushed rock is used for construction or maintenance of roads used to manage or harvest forest products in the SMA.

(2) A determination by the Forest Service finds that the use does not adversely affect the scenic, cultural, natural, or recreation resources.

D. Solid Waste Disposal Sites and Sanitary Landfills in the SMA: Solid waste disposal sites or sanitary landfills are not allowed in the SMA.

5. Discontinuance of Existing Uses and Structures: Except as provided in Guidelines 3 and 3.F above, any use or structure that is discontinued for one (1) year or more shall not be considered an existing use or structure. Proof of intent to abandon is not required to determine that an existing use or use of an existing structure has been discontinued.

    A. Multiple Uses: An existing use or structure with more than one legally established use may discontinue one of the uses without discontinuing the others.

    B. Change in Use: An existing use or structure shall become discontinued if the use or use of the structure changes.

6. Discontinued Uses and Structures: Re-establishment or replacement of any use or structure that has been discontinued shall be subject to all applicable policies and guidelines in the Management Plan, including, but not limited to, guidelines for land use designations and scenic, cultural, recreation and natural resources.

CONSOLIDATION OF LOTS

GMA/SMA Guidelines

1. A unit of land shall be consolidated with adjacent lands in the same ownership if:

    A. In Oregon, the subdivision within which the unit of land is located is undeveloped pursuant to ORS chapter 92; or

    B. In Washington, if the unit of land is smaller than the current minimum parcel size and is located within a final plat that is older than five years from the date of filing.

2. No portion of a consolidated plat shall be considered a separate parcel solely because an existing parcel overlays, and possibly fragments, that consolidated subdivision.

3. Section 1 shall not be applied to consolidate two or more units of land where each unit of land is developed with a dwelling that qualifies as an existing use. One or more undeveloped units of land shall be consolidated with one or more developed units of land.

4. To carry out this section, counties shall develop their own procedures for consolidating units of land pursuant to this provision, including amending plats, vacating plats, replatting, or other similar legal action.

UNIFORM APPLICATION OF MANAGEMENT PLAN

GMA/SMA Policies

1. The Management Plan shall be applied consistent with and in the spirit of the National Scenic Area Act.

2. The Gorge Commission, Forest Service, and counties should strive to apply Management Plan provisions uniformly throughout the National Scenic Area, except when a county has adopted a more restrictive provision.

3. In applying provisions of the Management Plan, the Gorge Commission and Forest Service may consider, but shall not be constrained by, county interpretations, state interpretation and application of state law and administrative regulations, or judicial decisions that do not directly involve the Management Plan.

APPLYING NEW LESS-STRINGENT REGULATIONS TO DEVELOPMENT APPROVED UNDER PRIOR SCENIC AREA REGULATIONS

GMA/SMA Guidelines

1. A landowner may submit a land use application to alter conditions of approval for an existing use or structure approved under prior Scenic Area regulations (e.g., *Columbia River Gorge National Scenic Area Final Interim Guidelines*, original *Management Plan*), subject to the following standards:

    A. The applicant shall apply for the same development that was reviewed in the original decision.

    B. The development shall remain in its current location.

    C. The agency that currently has jurisdiction over the applicant's property shall review the application and send notice of the application to agencies and other parties entitled to receive notice under the current rules.

    D. The agency shall review the entire development to ensure that it would fully comply with all the current guidelines (i.e., land use, treaty rights, scenic resources, cultural resources, recreation resources and natural resources).

    E. The agency shall issue a new decision that supersedes the original decision.

F. The new decision may remove or revise original conditions of approval or add new conditions of approval to ensure full compliance with all the current guidelines.

USES ALLOWED OUTRIGHT

ALL LAND USE DESIGNATIONS, EXCEPT OPEN SPACE AND AGRICULTURE-SPECIAL

GMA/SMA Guidelines

1. The following uses may be allowed without review in all GMA and SMA land use designations, except GMA and SMA Open Space and GMA Agriculture-Special:

   A. In the General Management Area, agricultural uses except new cultivation. Any operation that would cultivate land that has not been cultivated, or has lain idle, for more than 5 years shall be considered new cultivation. For this guideline, cultivation and vegetation removal may be allowed in conjunction with a home garden.

   B. In the Special Management Area, agricultural uses within previously disturbed and regularly worked fields or areas.

   C. Forest practices in the General Management Area that do not violate conditions of approval for other approved uses and developments.

   D. Repair, maintenance and operation of existing structures, including, but not limited to, dwellings, agricultural structures, trails, roads, railroads, and utility facilities.

   E. Accessory structures 60 square feet or less in area and 10 feet or less in height, unless within the buffer zone of a wetland, stream, pond, lake or riparian area. This category does not include signs, fences, outdoor lights, retaining walls, flagpoles, transportation facilities, or utility facilities.

   F. Wire-strand or woven-wire fences used for gardens, yards, livestock, and similar uses less than or equal to 500 feet in length and less than or equal to 10 feet in height that are accessory to an existing dwelling, provided woven-wire fences (posts and wire) are brown or black if visible from key viewing areas. Height is measured from the ground to the top wire.

   G. Wire-strand fences less than or equal to 48 inches in height that are outside deer and elk winter range as delineated in the Gorge Commission/USDA Forest Service natural resource inventories or determined by an appropriate

federal or state agency. Height is measured from the ground to the top wire. This category does not include fences associated with transportation facilities or utility facilities.

H. The following transportation facilities:

(1) Replace existing safety or protective structures, including guardrails, access control fences and gates, barriers, energy attenuators, safety cables, and traffic signals and controllers, provided the replacement structures are (1) the same location and size as the existing structures and (2) the same building materials as the existing structures, or building materials that are dark brown with a flat, non-reflective finish, or building materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled “Scenic Travel Corridors” (Part I, Chapter 1).

(2) Replace existing traffic detection devices, vehicle weighing devices, and signal boxes, provided the replacement structures are (1) the same location and size as the existing structures and (2) the same building materials as the existing structures, or building materials that are dark brown with a flat, non-reflective finish, or building materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled “Scenic Travel Corridors” (Part I, Chapter 1).

(3) New raised pavement markers, guide posts, object markers, inlay markers, and pavement markings and striping.

(4) Permanent public regulatory, guide, and warning signs, except those excluded below, provided (1) the signs comply with the *Manual for Uniform Traffic Control Devices* and (2) the support structures and backs of all signs are dark brown with a flat, non-reflective finish. This category does not include specific service signs; destination and distance signs; variable message signs; or signs that bridge or are cantilevered over the road surface.

(5) Extensions of existing guardrails less than or equal to 50 feet in length and new guardrail ends for existing guardrails, provided the guardrails and guardrail ends are (1) located inside rights-of-way that have been disturbed in the past and (2) constructed of materials that match the existing structure, natural wood, weathering steel (e.g., Corten), or

materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled "Scenic Travel Corridors" (Part I, Chapter 1).

(6) New guardrails and guardrail ends, provided the structures are (1) located inside rights-of-way that have been disturbed in the past and (2) constructed of natural wood, weathering steel (e.g., Corten), or materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled "Scenic Travel Corridors" (Part I, Chapter 1). This category does not include jersey barriers.

(7) In the General Management Area, replace and/or expand existing culverts, provided the entity or person owning or operating the culvert shall obtain all necessary federal and state permits that protect water quality and fish and wildlife habitat before construction.

(8) In the Special Management Area, replace and/or expand existing culverts for ephemeral streams or ditches, provided the visible ends of culverts shall be dark and non-reflective.

(9) Resurface or overlay existing paved roads, provided the activity does not (1) increase the width of a road, (2) disturb the toe of adjacent embankments, slopes or cut banks, or (3) change existing structures or add new structures.

(10) Apply dust abatement products to non-paved road surfaces.

(11) Grade and gravel existing road shoulders, provided the activity does not (1) increase the width of a road, (2) disturb the toe of adjacent embankments, slopes or cut banks, or (3) change existing structures or add new structures.

(12) Replace the superstructure of bridges (e.g., decks, beams) for bridges less than or equal to 30 feet in length and less than or equal to 1,000 square feet in area. This category does not include guardrails or the substructure of bridges (e.g., foundations, abutments).

I. The following underground utility facilities:

(1) Replace or modify existing underground utility facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past or co-locate new underground utility facilities with existing underground facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past, provided no excavation would extend beyond the depth and extent of the original excavation.

(2) Replace or modify existing underground utility facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past or co-locate new underground utility facilities with existing underground facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past, provided (1) no excavation would extend more than 12 inches beyond the depth and extent of the original excavation, (2) no ditch for linear facilities would be more than 24 inches wide, (3) no excavation for non-linear facilities would exceed 10 cubic yards, and (4) no recorded archaeological site is located within 500 feet of the development.

To comply with (4), the entity or person undertaking the development shall contact the Washington Office of Archaeology and Historic Preservation or the Oregon State Historic Preservation Office and obtain a letter or other document stating no recorded archaeological site is located within 500 feet of the development.

J. The following aboveground and overhead utility facilities:

(1) Replace existing aboveground and overhead utility facilities including towers, pole/tower-mounted equipment, cables and wires, anchors, pad-mounted equipment, service boxes, pumps, valves, pipes, water meters, and fire hydrants, provided the replacement facilities would have (1) the same location and size as the existing facilities and (2) the same building materials as the existing facilities, or building materials that are dark brown with a flat, non-reflective finish, or building materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled “Scenic Travel Corridors” (Part I, Chapter 1).

(2) Replace existing utility poles, provided the replacement poles are (1) located within 5 feet of the original poles, (2) no more than 5 feet taller and 6 inches wider than the original poles, and (3) constructed of natural wood, weathering steel (e.g., Corten), materials that match the original poles, or materials that are dark brown with a flat, non-reflective finish.

(3) New whip antennas for public service less than or equal to 8-feet in height and less than or equal to 2 inches in diameter, cables, wires, transformers, and other similar equipment, provided all such structures are on existing utility poles or towers.

K. Flagpoles that are accessory to the principal building on a parcel, provided the height of the flagpole is less than or equal to the height of the highest ridgeline or parapet of the principal building.

L. The following signs:

(1) Election signs. Removal must be accomplished within 30 days of election day.

(2) "For sale" signs not greater than 12 square feet. Removal must be accomplished within 30 days of close of sale.

(3) Temporary construction site identification, public service company, safety, or information signs not greater than 32 square feet. Exceptions may be granted for public highway signs necessary for public safety and consistent with the *Manual for Uniform Traffic Control Devices*. Removal must be accomplished within 30 days of project completion.

(4) Signs posted on private property warning the public against trespassing, danger from animals, the private nature of a road, driveway or premise, or signs prohibiting or otherwise controlling fishing or hunting, provided such signs are not greater than 6 square feet in the General Management Area and 2 square feet in the Special Management Area.

(5) Temporary signs advertising civil, social, or political gatherings and activities, provided such signs do not exceed 12 square feet. Removal must be accomplished within 30 days of the close of the event.

(6) Signs posted by governmental jurisdictions giving notice to the public. Such signs shall be no larger than that required to convey the intended message.

(7) In the General Management Area, signs associated with the use of a building or buildings, if placed flat on the outside walls of buildings (not on roofs or marquees).

M. In the General Management Area, wind machines for frost control in conjunction with agricultural use.

GMA AND SMA OPEN SPACE

GMA/SMA Guidelines

1. The following uses may be allowed without review in GMA and SMA Open Space:

   A. Repair, maintenance and operation of existing structures, including, but not limited to, dwellings, agricultural structures, trails, roads, railroads, and utility facilities.

   B. The following transportation facilities:

      (1) Replace existing safety or protective structures, including guardrails, access control fences and gates, barriers, energy attenuators, safety cables, and traffic signals and controllers, provided the replacement structures are (1) the same location and size as the existing structures and (2) the same building materials as the existing structures, or building materials that are dark brown with a flat, non-reflective finish, or building materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled "Scenic Travel Corridors" (Part I, Chapter 1).

      (2) Replace existing traffic detection devices, vehicle weighing devices, and signal boxes, provided the replacement structures are (1) the same location and size as the existing structures and (2) the same building materials as the existing structures, or building materials that are dark brown with a flat, non-reflective finish, or building materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled "Scenic Travel Corridors" Part I, Chapter 1).

      (3) New raised pavement markers, guide posts, object markers, inlay markers, and pavement markings and striping.

      (4) Permanent public regulatory, guide, and warning signs, except those excluded below, provided (1) the signs comply with the *Manual for Uniform Traffic Control Devices* and (2) the support structures and backs of all signs are dark brown with a flat, non-reflective finish. This category does not include specific service signs; destination and distance signs; variable message signs; or signs that bridge or are cantilevered over the road surface.

(5) Extensions of existing guardrails less than or equal to 50 feet in length and new guardrail ends for existing guardrails, provided the guardrails and guardrail ends are (1) located inside rights-of-way that have been disturbed in the past and (2) constructed of materials that match the existing structure, natural wood, weathering steel (e.g., Corten), or materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled "Scenic Travel Corridors" (Part I, Chapter 1).

(6) New guardrails and guardrail ends, provided the structures are (1) located inside rights-of-way that have been disturbed in the past and (2) constructed of natural wood, weathering steel (e.g., Corten), or materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled "Scenic Travel Corridors" (Part I, Chapter 1). This category does not include jersey barriers.

(7) In the General Management Area, replace and/or expand existing culverts, provided the entity or person owning or operating the culvert shall obtain all necessary federal and state permits that protect water quality and fish and wildlife habitat before construction.

(8) In the Special Management Area, replace and/or expand existing culverts for ephemeral streams or ditches, provided the visible ends of culverts shall be dark and non-reflective.

(9) Resurface or overlay existing paved roads, provided the activity does not (1) increase the width of a road, (2) disturb the toe of adjacent embankments, slopes or cut banks, or (3) change existing structures or add new structures.

(10) Apply dust abatement products to non-paved road surfaces.

(11) Grade and gravel existing road shoulders, provided the activity does not (1) increase the width of a road, (2) disturb the toe of adjacent embankments, slopes or cut banks, or (3) change existing structures or add new structures.

(12) Replace the superstructure of bridges (e.g., decks, beams) for bridges less than or equal to 30 feet in length and less than or equal to 1,000

square feet in area. This category does not include guardrails or the substructure of bridges (e.g., foundations, abutments).

C. The following underground utility facilities:

(1) Replace or modify existing underground utility facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past or co-locate new underground utility facilities with existing underground facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past, provided no excavation would extend beyond the depth and extent of the original excavation.

(2) Replace or modify existing underground utility facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past or co-locate new underground utility facilities with existing underground facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past, provided (1) no excavation would extend more than 12 inches beyond the depth and extent of the original excavation, (2) no ditch for linear facilities would be more than 24 inches wide, (3) no excavation for non-linear facilities would exceed 10 cubic yards, and (4) no recorded archaeological site is located within 500 feet of the development.
To comply with (4), the entity or person undertaking the development shall contact the Washington Office of Archaeology and Historic Preservation or the Oregon State Historic Preservation Office and obtain a letter or other document stating no recorded archaeological site is located within 500 feet of the development.

D. The following aboveground and overhead utility facilities:

(1) Replace existing aboveground and overhead utility facilities including towers, pole/tower-mounted equipment, cables and wires, anchors, pad-mounted equipment, service boxes, pumps, valves, pipes, water meters, and fire hydrants, provided the replacement facilities would have (1) the same location and size as the existing facilities and (2) the same building materials as the existing facilities, or building materials that are dark brown with a flat, non-reflective finish, or building materials consistent with the *Historic Columbia River Highway Master Plan* for the Historic Columbia River Highway or a scenic highway corridor strategy for Interstate 84 or Washington State Route 14 prepared according to the GMA policies in the section of the Scenic Resources chapter of the Management Plan titled “Scenic Travel Corridors” (Part I, Chapter 1).

(2) Replace existing utility poles, provided the replacement poles are (1) located within 5 feet of the original poles, (2) no more than 5 feet

taller and 6 inches wider than the original poles, and (3) constructed of natural wood, weathering steel (e.g., Corten), materials that match the original poles, or materials that are dark brown with a flat, non-reflective finish.

(3) New whip antennas for public service less than or equal to 8-feet in height and less than or equal to 2 inches in diameter, cables, wires, transformers, and other similar equipment, provided all such structures are on existing utility poles or towers.

E. The following signs:

(1) Election signs. Removal must be accomplished within 30 days of election day.

(2) "For sale" signs not greater than 12 square feet. Removal must be accomplished within 30 days of close of sale.

(3) Temporary construction site identification, public service company, safety, or information signs not greater than 32 square feet. Exceptions may be granted for public highway signs necessary for public safety and consistent with the *Manual for Uniform Traffic Control Devices*. Removal must be accomplished within 30 days of project completion.

(4) Signs posted on private property warning the public against trespassing, danger from animals, the private nature of a road, driveway or premise, or signs prohibiting or otherwise controlling fishing or hunting, provided such signs are not greater than 6 square feet in the GMA and 2 square feet in the SMA.

(5) Temporary signs advertising civil, social, or political gatherings and activities, provided such signs do not exceed 12 square feet. Removal must be accomplished within 30 days of the close of the event.

(6) Signs posted by governmental jurisdictions giving notice to the public. Such signs shall be no larger than that required to convey the intended message.

(7) In the General Management Area, signs associated with the use of a building or buildings, if placed flat on the outside walls of buildings (not on roofs or marquees).

EXPEDITED DEVELOPMENT REVIEW PROCESS

GMA/SMA Guidelines

Development Eligible for Expedited Review

1. The following developments may be reviewed using the expedited development review process, provided they comply with the resource protection and procedural guidelines listed below.

   A. Except in Open Space and Agriculture-Special, accessory structures between 60 and 200 square feet in area and 10 feet or less in height. Only one accessory building per parcel may be allowed under this guideline, regardless of whether the parcel already includes an accessory building(s). Additional accessory buildings shall be subject to full review. This category does not include signs, decks, fences, outdoor lights, retaining walls, transportation facilities, or utility facilities.

   B. Additions and covered decks for existing buildings, provided the existing building is at least 500 square feet in area and the addition or covered deck is no larger than 200 square feet in area and no taller than the height of the existing building. Only one addition and one covered deck per parcel may be allowed under this guideline, regardless of whether the parcel already includes an addition or covered deck.

   C. Rail, solid or semi-solid fences accessory to existing dwellings less than or equal to 6 feet in height and less than or equal to 100 feet in length.

   D. Wire-strand fences other than those allowed outright, provided the fence complies with the "Approval Criteria for Fences in Deer and Elk Winter Range" (Part I, Chapter 3: Natural Resources, GMA Wildlife Habitat) if it is inside deer and elk winter range as delineated in the Gorge Commission/USDA Forest Service natural resource inventories or determined by an appropriate federal or state agency.

   E. In the General Management Area, woven-wire fences for agricultural use that would enclose 80 acres or less.

   F. Decks that are (1) uncovered, (2) attached and accessory to existing dwellings, and (3) 500 square feet or less in area and 30 inches or less in height above existing grade.

   G. Road closure gates.

   H. Signs, other than those allowed outright.

I. Outdoor lights.

J. Air, weather, water and other similar research and monitoring facilities, provided the facilities are attached to existing structures or are less than or equal to 120 square feet in size and less than or equal to 12 feet in height.

K. Lot line adjustments in the General Management Area that would not result in the potential to create additional parcels through subsequent land divisions, subject to the GMA guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines), except all lot line adjustments for parcels designated Open Space, Agriculture-Special, Public Recreation, or Commercial Recreation shall be reviewed through the full development review process.

L. Lot line adjustments in the Special Management Area, subject to the SMA guidelines in "Lot Line Adjustments" (Part II, Chapter 7: General Policies and Guidelines) and SMA Residential Land Policy 4.

M. Removal/demolition of structures that are less than 50 years old**,** including wells, septic tanks and fuel tanks.

N. Decommission non-paved roads, including ripping the road surface, barriers, and revegetation.

O. Trail reconstruction involving up to 1,000 feet of trail re-route.

P. The following transportation facilities, provided they are not a part of larger construction or reconstruction projects (which shall be reviewed as a whole):

(1) New guardrails and guardrail ends, other than those allowed outright, and new wire-strand and woven-wire access control fences. This category does not include jersey barriers.

(2) New traffic detection devices, vehicle weighing devices, and signal boxes less than or equal to 120 square feet in size and less than or equal to 12 feet in height. This category does not include signs.

(3) Pave existing dirt and gravel roads, provided the activity does not increase the width of the road or disturb the toe of adjacent embankments, slopes or cut banks.

(4) New weather, air, traffic or other monitoring equipment attached to existing structures or that are less than or equal to 120 square feet in size and less than or equal to 12 feet in height.

Q. Except in Agriculture-Special, the following underground utility facilities:

(1) New underground utility facilities located inside road, utility or railroad rights-of-way or easements that have been disturbed in the past, provided (1) no ditch for linear facilities would be more than 36 inches wide and (2) no excavation for non-linear facilities would exceed 20 cubic yards.

R. The following aboveground and overhead utility facilities:

(1) Modify existing aboveground and overhead utility facilities or, except in Agriculture-Special, develop new aboveground and overhead utility facilities including building and equipment foundations, poles, transformers, conduit, fencing, pumps, valves, pipes, and water meters, provided the development would be less than or equal to 120 square feet in area and less than or equal to 12 feet in height.

(2) Replace existing aboveground and overhead utility facilities including building and equipment foundations, poles, transformers, conduit, fencing, pumps, valves, pipes, and water meters, provided the replacement facilities would be in the same location as and no more than 15 percent larger than the physical size of the existing facilities.

(3) New antennas and associated support structures necessary for public service on existing wireless communication poles and towers other than those allowed outright, provided the size is the minimum necessary to provide the service.

S. Replace an existing mobile home in a mobile home space within a mobile home park, provided (1) the mobile home to be replaced, the mobile home space and the mobile home park shall be existing, lawful uses according to the definition of *existing use or structure* and Guidelines 1 through 4 in the section titled “Existing Uses” of this chapter; (2) the replacement mobile home shall be in the same location as the mobile home to be replaced; (3) the height of the replacement mobile home shall be no more than 20 percent greater than the mobile home to be replaced, and (4) the mass and footprint of the replacement mobile home shall be no more than 100 percent greater than a single-wide mobile home to be replaced or no more than 25 percent greater than a double-wide mobile home to be replaced.

T. Retaining walls accessory to existing dwellings less than or equal to 2 feet in height and less than or equal to 100 feet in length.

U. In the Special Management Area, wind machines for frost control in conjunction with agricultural use.

Resource and Treaty Rights Protection Guidelines

1. Proposed developments reviewed using the expedited review process shall comply with the following resource protection guidelines:

   A. Scenic

      (1) In the General Management Area, the scenic resource protection guidelines shall not apply to woven-wire fences for agricultural use that would enclose 80 acres or less.

      (2) Except signs, the colors of structures topographically visible from key viewing areas shall be dark earth-tones found at the specific site or the surrounding landscape. The specific colors or list of acceptable colors shall be included as a condition of approval. This guideline shall not apply to additions, which may match the color of existing buildings.

      (3) Except signs, structures topographically visible from key viewing areas shall use low or non-reflective building materials, including roofing, gutters, vents, and chimneys.

      (4) Outdoor lights shall be directed downward and sited, hooded, and shielded such that they are not highly visible from key viewing areas. Shielding and hooding materials shall be composed of non-reflective, opaque materials.

      (5) Signs shall comply with the applicable sign guidelines in the Management Plan (Part I, Chapter 1: Scenic Resources GMA Sign guidelines and Part II Chapter 7, SMA Sign guidelines).

      (6) Structures within ½-mile of a key viewing area and topographically visible from the key viewing area shall be sited, screened and/or designed to achieve the applicable scenic standard (e.g., visual subordinance, not visually evident).

   B. Cultural

      (1) The expedited development review process shall only be used to review proposed development that does not require a reconnaissance survey or historic survey. The GMA Cultural Resources Policies 6 and 7 (Part I, Chapter 2) shall be used to determine if a reconnaissance and/or historic survey is required for a proposed development.

      (2) The GMA “Cultural Resources Discovered After Construction Begins” Guideline 1 and “Discovery if Human Remains” Guideline 1 (Part I,

Chapter 2) shall be applied as conditions of approval for all development approved under the expedited development review process.

C. Recreation

(1) The development shall not detract from the use and enjoyment of established recreation sites on adjacent parcels.

D. Natural

(1) Wetlands, Streams, Rivers, Ponds, and Lakes

(a) The development is outside buffer zones for wetlands, streams, rivers, ponds, and lakes. This guideline shall not apply to lot line adjustments or development located inside road, utility or railroad rights-of-way or easements that have been previously disturbed and regularly maintained.

(2) Sensitive Wildlife and Sensitive Plants

(a) The development meets one of the following:

(i) The development is at least 1,000 feet from known sensitive wildlife areas or sites (excluding sensitive aquatic species, deer winter range, and turkey habitat) and known sensitive plants; or

(ii) The development does not disturb the ground or is inside road, utility or railroad rights-of-way or easements or other areas that have been previously disturbed and regularly maintained; or

(iii) For sensitive wildlife, the development is within 1,000 feet of known sensitive wildlife areas or sites (excluding sensitive aquatic species, deer winter range and turkey habitat), but an appropriate federal or state wildlife agency determines (1) the sensitive wildlife area or site is not active or (2) the proposed development would not compromise the integrity of the wildlife area or site or occur during the time of the year when wildlife species are sensitive to disturbance.

For sensitive plants, the development is within 1,000 feet of known sensitive plants, but the Oregon or Washington Natural Heritage Program or a person with recognized expertise in botany or plant ecology hired by the applicant has determined

that the development would be at least 200 feet from the sensitive plants.

(b) Development eligible for expedited review shall be exempt from the field surveys for sensitive wildlife or sensitive plants [see GMA “Site Plans and Field Surveys for Review Uses Near Sensitive Wildlife Areas and Sites” Guidelines 1 and 2, and “Site Plans and Field Surveys for Review Uses Near Sensitive Plants” Guidelines 1 and 2 (Part I, Chapter 3)].

2. Proposed developments reviewed using the expedited review process shall comply with the following treaty rights protection guidelines:

A. Proposed developments shall not affect or modify any treaty or other rights of any Indian tribe.

B. The expedited development review process shall cease and the proposed development shall be reviewed using the full development review process if an Indian tribe submits substantive written comments during the comment period that identify the treaty rights that exist in the project vicinity and explain how they would be affected or modified by the proposed development.

C. Except as provided in 2.B above, the GMA and SMA treaty rights and consultation goals, policies and guidelines in Chapter 3, Section IV of the Management Plan shall not apply to proposed developments reviewed under the expedited review process.

Procedural Guidelines

1. Applications

A. Applications for uses eligible for expedited review shall include the information required for review uses listed in Guideline 3, "Review Uses" (Part II, Chapter 7: General Policies and Guidelines). They shall also include elevation drawings if the proposed development would be visible from a key viewing area. The drawing shall show natural grade and finished grade.

2. Comment Period

A. Reviewing agencies shall send a copy of all applications for developments to be reviewed under the expedited review process to the four Indian tribal governments, the Gorge Commission, and the Forest Service.

B. Reviewing agencies shall allow the Indian tribal governments, the Gorge Commission, and the Forest Service at least 10 days from the date a notice is sent to submit written comments on the proposed development.

3. Written Decision

   A. Reviewing agencies shall prepare written decisions for all development reviewed under the expedited review process. The decisions shall include findings of fact, conclusions of law and, if necessary, conditions of approval.

4. Notice of Decision and Opportunity to Appeal

   A. Reviewing agencies shall send a copy of all decisions issued under the expedited review process to the Indian tribal governments, the Gorge Commission, the Forest Service, and landowners within 200 feet of the perimeter of the subject parcel.

   B. Any person shall be allowed to appeal a decision issued under the expedited review process.

EMERGENCY/DISASTER RESPONSE ACTIONS

GMA/SMA Policies

1. Notification of emergency/disaster response actions is required in order to:

   A. Provide responding parties early access to inventory information on sensitive resources that may be affected by emergency response actions;

   B. Prevent or minimize resource impacts from such actions, reducing the need for post-emergency mitigation/restoration;

   C. Achieve the above purposes while allowing actions necessary to protect life, property, public services, and the environment during an emergency or disaster.

2. Post-emergency/disaster response development review is required in order to evaluate whether such response actions have impacted scenic, natural, cultural or recreation resources. Adverse impacts of the response actions shall be mitigated to the greatest extent practicable. The review process shall be expedited to facilitate timely mitigation/restoration efforts, where needed. The party(ies) submitting the post-emergency/disaster response application shall be responsible for implementing any required mitigation/restoration, unless: (1) other responding parties agree to assume such responsibility, upon mutual agreement of the parties; or (2) the landowner denies access for mitigation/restoration activities, in which cast the landowner assumes responsibility.

3. Nothing in these provisions shall be interpreted to excuse compliance with other applicable state or federal law.

GMA/SMA Guidelines

1. General Guidelines

   A. Actions taken in response to an emergency/disaster event, as defined in the Glossary, are allowed in all GMA/SMA land use designations, subject to the notification requirements in the following section (see "Notification Requirements").

   B. Following emergency/disaster response actions, best management practices (BMPs) to prevent sedimentation and provide erosion control shall be utilized whenever disaster response actions necessitate vegetation removal, excavation, and/or grading. BMPs may include but are not limited to: use of straw bales, slash windrows, filter fabric fences, sandbags, straw cover, jute netting, etc.

   C. Structures or development installed or erected for a temporary use (e.g. sandbags, check dams, plastic sheeting, chain link fences, debris walls, etc.) shall be removed within one year following an emergency event. If it can be demonstrated that the continued use of these devices is necessary to protect life property, public services or the environment, an extension of no more than two years may be granted by the agency administering the Scenic Area ordinance or the Forest Service for federal agency actions.

   D. The new exploration, development (extraction or excavation), and production of mineral resources, used for commercial, private or public works projects, shall not be conducted as an emergency/disaster response activity.

   E. No spoils resulting from grading or excavation activities shall be deliberately deposited into a wetland, stream, pond, lake or riparian area within the National Scenic Area (NSA) as a part of an emergency/disaster response action. The only exception to this is for construction of a fire line during a wildfire, where avoiding the aquatic area or its buffer zone has been considered and determine to not be possible without further jeopardizing life or property.

2. Notification Requirements

   A. Actions taken in response to an emergency/disaster event, as defined in the Glossary, are allowed in all GMA and SMA land use designations, subject to the following notification requirements.

      (1) Notification of an emergency/disaster response activity shall be submitted either within 48 hours of the commencement of a response action, or by the next business day following the start of such an action, whichever is sooner. Notification shall be submitted by the party conducting an emergency/disaster response activity or their representatives. In the case of multiple responding parties, the first party to respond shall provide the

required notification, unless, upon mutual agreement of responding parties, another responder elects to assume this responsibility.

(2) Notification shall be submitted by mail, fax, telephone, e-mail or in person. If notification occurs by telephone, a hard copy of the notification shall be submitted by mail or in person within 7 days.

(3) Notification shall be furnished to the agency administering the Scenic Area ordinance, or the Forest Service for federal agency actions.

(4) At a minimum, the following information shall be required at the time of notification:

(a) Nature of emergency/disaster event.

(b) Description of emergency/disaster response activities and magnitude of response actions to be taken, if applicable (such as extent of earth movement, erection of structures, etc.).

(c) Location of emergency/disaster response activities.

(d) Estimated start and duration of emergency/disaster response activities.

(e) Contact person and phone number for the parties conducting emergency/disaster response actions.

(5) Repair and maintenance of an existing serviceable structure to its previously authorized and undamaged condition are not subject to the above referenced notification requirements.

B. Upon notification of an emergency/disaster response action, the Gorge Commission, applicable planning department, or Forest Service shall, as soon as possible:

(1) Review its natural resource inventory data and notify the contact person for the emergency/disaster response actions of all inventoried natural resource sites and their buffers, that are within or adjacent to the response area or that may be adversely affected by response activities;

(2) Notify the Oregon or Washington Department of Fish and Wildlife of all noticed emergency/disaster response actions, to provide that agency an opportunity to consult with responding agencies during the event, and;

(3) Notify the Forest Service, the Oregon Historic Preservation Office or the Office of Washington Office of Archeology and Historic Preservation, and

the tribal governments of all emergency/disaster response activities. The Forest Service will review their cultural resource inventory data and notify the contact person for the emergency/disaster response action as soon as possible of all inventoried cultural resource sites, or their buffers, that are within, or adjacent to, emergency/disaster response areas.

C. Upon notification of a response action, the Forest Service shall, as soon as possible, offer the services of a resource advisor to the agency(ies) conducting the response action. The resource advisor will provide on-site advice to minimize impacts to resources from emergency/disaster response actions.

3. Post-Emergency/Disaster Response Development Review Application Requirements

A. Within 30 days following notification, a post-emergency/disaster response application shall be submitted by the party conducting the response action to the Gorge Commission, applicable planning department, or Forest Service for federal agency actions. In the case of an event with multiple responding parties, the agency providing initial notification as required herein shall submit the application. An exception to this may occur if another responding party, by mutual agreement with the other respondents, elects to submit the application. Requests to extend this submittal deadline may be made in writing and shall include the reason why an extension is necessary. Extensions shall not exceed 30 days in duration and not more than two (2) extensions shall be granted.

B. Post-emergency/disaster response applications shall only address development activities conducted during an emergency/disaster response. Applications shall specify if development placed during an emergency/disaster event is permanent or temporary. The terms "development activities" and "development" include the disposal of any spoil materials associated with an emergency/disaster response action. Applicants shall be responsible for operations under their control and that of other responders, upon mutual agreement. Responders not agreeing to have another responder address their actions shall be responsible to submit an application for those actions.

C. Emergency/disaster response actions not involving structural development or ground disturbance with mechanized equipment are exempt from these requirements, except for those actions within 500 feet of a known cultural resource (as determined in the notification process).

D. Applications shall include the following information:

(1) Applicants name and address.

(2) Location of emergency/disaster response.

(3) A written description of the emergency/disaster response, including any structures erected, excavation or other grading activities, or vegetation removal.

(4) A map of the project area drawn to scale, at a scale of 1 inch = 200 feet or a scale providing greater detail. The map shall include:

(a) North arrow and scale.

(b) Boundaries, dimensions and size of subject parcel(s).

(c) Bodies of water, watercourses, and significant landforms.

(d) Existing roads and structures.

(e) New structures placed and any vegetation removal, excavation or grading resulting from the response actions.

(5) An exception to the scale requirements in Guideline 3.D(4) above may be granted for an event encompassing an area greater than one square mile. In such cases, a clear sketch map of the entire response action area shall be provided. In addition, a map of 1 inch = 200 feet or a scale providing greater detail shall be provided that shows a section of the response area exemplifying the specific actions taken.

E. Emergency/disaster response review uses may be allowed pursuant to a process that provides at minimum the following:

(1) Notice of the application to landowners within 200 feet of the perimeter of the subject parcel, the Forest Service, Gorge Commission, four tribal governments and interested parties.

(2) A written decision with findings of fact and conclusions of law.

(3) An opportunity to request a hearing.

4. Post-Emergency/Disaster Response Development Review

Actions taken in all land use designations within the GMA/SMA that are in response to an emergency/disaster event, as defined in the Glossary, shall be reviewed for compliance with the following guidelines.

A. Scenic Resources

(1) Impacts of emergency/disaster response actions shall be evaluated to ensure that scenic resources are not adversely affected. In the GMA, such actions shall be rendered visually subordinate in their landscape

setting as seen from key viewing areas to the greatest extent practicable, except for actions located in areas exempted from visual subordinance requirements in "Developed Settings and Visual Subordinance Policies" (Part I, Chapter 1: Scenic Resources). In the SMA, such actions shall meet the scenic standard to the greatest extent practicable.

(2) Vegetation shall be used to screen or cover road cuts, structural development, landform alteration, and areas denuded of vegetation, as a result of emergency/disaster response actions.

(3) Areas denuded of vegetation as a result of emergency/disaster response actions shall be revegetated with native plant species, or species commonly found within the applicable landscape setting, to restore the affected areas to its pre-response condition to the greatest extent practicable. Revegetation shall occur as soon as practicable, but no later than one year after the emergency/disaster event. An exception to the one-year requirement may be granted upon demonstration of just cause, with an extension up to one year.

(4) The painting, staining or use of other materials on new structural development shall be used to ensure that the structures are non-reflective, or of low reflectivity, and visually subordinate in their landscape setting as seen from key viewing areas, unless the structure is fully screened from key viewing areas by existing topographic features.

(5) Additions to existing structures, resulting from an emergency/disaster response action, which are smaller in total height, bulk or area than the existing structures may be the same color as the existing development. Additions larger than the existing development shall be visually subordinate in their landscape setting as seen from key viewing areas to the greatest extent practicable.

(6) In the General Management Area, spoil materials associated with grading, excavation and slide debris removal activities in relation to an emergency/disaster response action shall comply with the following standards:

(a) The spoil materials shall either be:

(i) Removed from the NSA,

(ii) Deposited at a site within the NSA permitted by the agency administering a Scenic Area land use ordinance, or

(iii) (Re)contoured, to the greatest extent practicable, to retain the natural topography, or a topography which emulates that of the surrounding landscape.

(b) The agency administering a Scenic Area ordinance shall decide whether an applicant removes the spoil materials [4.A(6)(a)(i)], deposits the spoil materials [4.A(6)(a)(ii)], or (re)contours the spoils materials [4.A(6)(a)(iii)]. The applicant does not make this decision.

(c) The agency administering an ordinance shall select the action in Guideline 4.A(6)(a) that, to the greatest extent practicable, best complies with the policies and guidelines in the Management Plan that protect scenic, cultural, recreation, and natural resources.

(d) Disposal sites created according to 4.A(6)(a)(ii) shall only be used for spoil materials associated with an emergency/disaster response action. Spoil materials from routine road maintenance activities shall not be deposited at these sites.

(7) In the Special Management Area, spoil materials associated with grading, excavation and slide debris removal activities in relation to an emergency/disaster response action shall comply with the following standards:

(a) The spoil materials shall either be:

(i) Removed from the NSA, or

(ii) Deposited at a site within the NSA permitted by the agency administering a Scenic Area land use ordinance within two years of the emergency.

(b) After the spoils materials are removed, the emergency disposal site shall be rehabilitated to meet the scenic standard.

(c) All grading (i.e., recontouring) shall be completed within 30 days after the spoils materials are removed.

(d) Sites shall be replanted using native plants found in the landscape setting or ecoregion to the maximum extent practicable.

(e) All revegetation shall take place within one (1) year of the date an applicant completes the grading.

(f) This provision shall take effect two years after the date of Management Plan concurrence by the U.S. Secretary of Agriculture, or approval of a disposal site, which ever comes first.

B. Cultural Resources and Treaty Rights

(1) To the greatest extent practicable, emergency/disaster response actions shall not adversely affect cultural resources. Emergency/disaster response actions shall not affect tribal treaty rights.

(2) The USDA Forest Service shall determine if a reconnaissance survey or historic survey is necessary within three days after receiving notice that a post-emergency land use application has been received by the agency administering the Scenic Area ordinance.

(a) Reconnaissance surveys shall be conducted by the USDA Forest Service and comply with the standards in GMA Guideline 1, Reconnaissance Surveys—Small-Scale Uses (Part I, Chapter 2: Cultural Resources, Surveys and Survey Reports). Reconnaissance survey reports shall comply with the standards in GMA Guideline 1, Reconnaissance Surveys—Large-Scale Uses (Part I, Chapter 2: Cultural Resources, Surveys and Survey Reports).

(b) Historic surveys shall be conducted by the USDA Forest Service and shall describe any adverse effects to historic resources resulting from an emergency/disaster response action. Historic surveys shall document the location, form, style, integrity, and physical condition of historic buildings and structures. Such surveys shall also include original photographs, if available, and maps, and should use archival research, blueprints, and drawings as necessary.

(3) Following the submittal of a post-emergency land use application, in addition to other public notice requirements that may exist, the tribal governments shall be notified by the development review offer when (1) a reconnaissance survey is required or (2) cultural resources exist in the project area. Notices shall include a site plan. Tribal governments shall have 15 calendar days from the date a notice is sent to submit written comments. Written comments should describe the nature and extent of any cultural resources that exist in the project area or treaty rights that exist in the project area and how they have been affected, and identify individuals with specific knowledge about them. The agency administering the Scenic Area ordinance shall send a copy of all comments to the Gorge Commission.

(4) When written comments are submitted in compliance with Guideline 4.B(3) above, the project applicant shall offer to meet within five calendar days with the interested persons. The five day consultation period may be extended upon agreement between the project applicant and the interested persons. A report shall be prepared by the agency administering the Scenic Area ordinance following the consultation meeting. Consultation meetings and reports shall comply with the standards in GMA Guideline 1, Consultation and Ethnographic Research (Part I, Chapter 2: Cultural Resources, Cultural Resource Reconnaissance and Historic Surveys) and Guidelines 1 and 2, Tribal Government Consultation (Part IV, Chapter 3: Indian Tribal Treaty Rights and Consultation).

(5) If cultural resources are discovered within the area disturbed by emergency response actions, the project applicant shall have a qualified professional conduct a survey to gather enough information to evaluate the significance of the cultural resources and what effects the action had on such resources. The survey and evaluation shall be documented in a report that generally follows the standards in GMA Guideline 1, Reconnaissance Survey Reports—Large-Scale Uses (Part I, Chapter 2: Cultural Resources, Surveys and Survey Reports) and GMA Guideline 1, Evaluation Criteria and Information Needs (Part I, Chapter 2: Cultural Resources, Evaluation of Significance).

(6) A mitigation plan shall be prepared by the project applicant if the affected cultural resources are significant. The mitigation plan shall be prepared according to the information, consultation, and report guidelines in GMA Mitigation Plan Criteria and Information Needs (Part I, Chapter 2: Cultural Resources, Mitigation Plans).

(7) The agency conducting the post-emergency development review shall submit a copy of all reconnaissance and historic survey reports and treaty rights protection plans to the SHPO and the tribal governments. Survey reports shall include measures to mitigate adverse effects to cultural resources resulting from emergency/disaster response actions. The SHPO and tribal governments shall have 15 calendar days from the date a survey report is mailed to submit written comments to the agency conducting the post-emergency development review. The agency shall record and address all written comments in the development review order.

(8) The agency conducting the post-emergency development review shall make a final decision on whether the emergency/disaster response actions are consistent with the applicable cultural resource goals, policies, and guidelines. If the final decision contradicts the comments submitted by the SHPO, or those submitted by a tribal government

regarding treaty rights, the agency shall justify how it reached an opposing conclusion.

(9) The cultural resource protection process may conclude when it has been determined that tribal treaty rights have not been not affected and one of the following conditions exists:

(a) The emergency/disaster response action does not require a reconnaissance or historic survey, or a reconnaissance survey demonstrates that no cultural resources are known to exist in the project area, and no substantiated concerns were voiced by interested persons within 15 calendar days of the date that a notice was mailed.

(b) The emergency/disaster response action avoided cultural resources that exist in the project area.

(c) Adequate mitigation measures to affected cultural resources have been developed and will be implemented.

(d) A historic survey demonstrates that emergency/disaster response actions, and associated development, had no effect on historic buildings or structures because:

(i) The SHPO concluded that the historic buildings or structures are clearly not eligible, as determined by using the criteria in the “National Register Criteria for Evaluation” (36 CFR 60.4), or

(ii) The emergency/disaster response actions did not compromise the historic or architectural character of the affected buildings or structures, or compromise features of the site that are important in defining the overall historic character of the affected buildings or structures, as determined by the guidelines and standards in *The Secretary of the Interior’s Standards for Rehabilitation* [U.S. Department of the Interior 1990] and *The Secretary of the Interior’s Standards for Historic Preservation Projects* [U.S. Department of the Interior 1983].

C. Natural Resources

(1) To the greatest extent practicable, emergency/disaster response actions shall not adversely affect natural resources.

(2) Buffer zones for wetlands, streams, ponds, riparian areas, sensitive wildlife sites or areas, and sites containing rare plants, shall be the same as those established in the Natural Resources Chapter (Part I, Chapter 4).

(3) Wetlands, Streams, Ponds, Lakes, Riparian Areas

(a) Emergency/disaster response actions occurring within a buffer zone of wetlands, streams, pond, lakes or riparian areas shall be reviewed by the Oregon or Washington Department of Fish and Wildlife. These areas are also referred to in this section as aquatic areas. State biologists will help determine if emergency/disaster response actions have affected or have a potential to affect these aquatic areas or their bigger zones. State biologists shall respond within 15 days of the date the application is mailed.

(b) When emergency/disaster response activities occur within wetlands, streams, ponds, lakes, riparian areas, or the buffer zones of these areas, the applicant shall demonstrate the following:

(i) All reasonable measures have been applied to ensure that the response actions have resulted in the minimum feasible alteration or destruction of the functions, existing contours, vegetation, fish and wildlife resources, and hydrology of wetlands, streams, ponds, lakes or riparian areas.

(ii) Areas disturbed by response activities and associated development will be rehabilitated to the maximum extent practicable.

(c) Impacts to wetlands, streams, ponds, lakes and riparian areas, and their buffers will be offset through mitigation and restoration to the greatest extent practicable. Mitigation and restoration efforts shall use native vegetation, and restore natural functions, contours, vegetation patterns, hydrology and fish and wildlife resources to the maximum extent practicable.

(d) If the agency conducting the post-emergency development review, in consultation with the state wildlife agency, determines that the emergency/disaster response actions had minor effects on the aquatic area or its buffer zone that could be eliminated with simple modifications, a letter shall be sent to the project applicant that describes the effects and measures that need to be taken to eliminate them. The state biologist, or a Forest Service natural resource advisor (as available) in consultation with the state biologist, shall visit the site in order to make this determination. If the project applicant accepts these recommendations, the agency

administering the Scenic Area ordinance shall incorporate them into its development review order and the aquatic area protection process may conclude.

(e) Unless addressed through Guideline 4.C(3)(d) above, mitigation and restoration efforts shall be delineated in a Rehabilitation Plan. Rehabilitation Plans shall satisfy the standards in GMA Guidelines 1.A through 1.B, Rehabilitation and Enhancement Plans (Part I, Chapter 3: Natural Resources). Rehabilitation plans shall also satisfy the following:

(i) Plans shall include a plan view and cross-sectional drawing at a scale that adequately depicts site rehabilitation efforts. Plans will illustrate final site topographic contours that emulate the surrounding natural landscape.

(ii) Planting plans shall be included that specify native plant species to be used, specimen quantities and plant locations.

(iii) The project applicant shall be responsible for the successful rehabilitation of all areas disturbed by emergency/disaster response activities.

(4) Wildlife Habitat

(a) Emergency/disaster response actions occurring within 1,000 feet of a sensitive wildlife area or site, shall be reviewed by the Oregon or Washington Department of Fish and Wildlife. State wildlife biologists will help determine if emergency/disaster response actions have affected or have a potential to affect a sensitive wildlife area or site.

(b) Site plans for emergency/disaster response sites shall be submitted by the agency conducting agency conducting the post-emergency development review to the Oregon or Washington Department of Fish and Wildlife for review as prescribed in GMA Guidelines 2 and 3, Approval Criteria for Review Uses Near Sensitive Wildlife Areas and Sites (Part I, Chapter 3: Natural Resources). The wildlife agency shall respond within 15 days of the date the application is mailed.

(c) The wildlife protection process may terminate if the agency conducting the post-emergency development review, in consultation with the state wildlife agency, determines (1) the sensitive wildlife area or site was not active, or (2) the emergency/disaster response did not compromise the integrity of the wildlife area or site or

occurred at a time when wildlife species are not sensitive to disturbance.

(d) If the agency conducting the post-emergency development review, in consultation with the state wildlife agency, determines that the emergency/disaster response activities had minor effects on the wildlife area or site that could be eliminated with simple modifications, a letter shall be sent to the project applicant that describes the effects and measures that need to be taken to eliminate them. The state wildlife biologist, or a Forest Service natural resource advisor (as available) in consultation with the state wildlife biologist, shall visit the site in order to make this determination. If the project applicant accepts these recommendations, the agency administering the Scenic Area ordinance shall incorporate them into its development review order and the wildlife protection process may conclude.

(e) If the agency conducting the post-emergency development review, in consultation with the state wildlife agency, determines that the emergency/disaster response activities had adverse effect on a sensitive wildlife area or site, the project applicant shall prepare a Wildlife Management Plan. Wildlife Management Plans shall comply with standards in GMA Guideline 2, Wildlife Management Plans (Part I, Chapter 3: Natural Resources). Upon completion of the Wildlife Management Plan, the agency shall:

(i) Submit a copy of the Wildlife Management Plan to the state wildlife agency for review. The state wildlife agency will have 15 days from the date that a plan is mailed to submit written comments to the agency conducting the post-emergency development review;

(ii) Record any written comments submitted by the state wildlife agency in its development review order. Based on these comments, the agency conducting the post-emergency development review shall make a final decision on whether the proposed use would be consistent with the wildlife policies and guidelines. If the final decision contradicts the comments submitted by the state wildlife agency, the agency shall justify how it reached an opposing conclusion.

(iii) Require the project applicant to revise the Wildlife Management Plan as necessary to ensure that the proposed use would not adversely affect a sensitive wildlife area or site.

(5) Deer and Elk Winter Range

(a) Any fencing permanently erected within deer and elk winter range, as a result of an emergency/disaster response, shall comply with the standards in GMA Approval Criteria for Fences in Deer and Elk Winter Range (Part I, Chapter 3: Natural Resources, Wildlife Habitat).

(6) Rare Plants

(a) Emergency/disaster response actions occurring within 1,000 feet of a sensitive plant, shall be reviewed by the Oregon or Washington Natural Heritage Program. State heritage staff will help determine if emergency/disaster response actions have occurred within the buffer zone of a rare plant.

(b) Site plans for emergency/disaster response sites shall be submitted to the Oregon or Washington Natural Heritage Program by the agency conducting the post-emergency development review. State natural heritage staff will, within 15 days from the date the application is mailed, identify the location of the affected plants and delineate a 200 foot buffer zone on the applicant's site plan.

(c) The rare plant protection process may conclude if the agency conducting the post-emergency development review, in consultation with the state natural heritage program, determines that emergency/disaster response activities occurred outside of a rare plan buffer zone.

(d) If the agency conducting the post-emergency development review, in consultation with the state natural heritage program, determines that the emergency/disaster response activities had minor effects on rare plants or the rare plant buffer zone, a letter shall be sent to the project applicant that describes the effects and measures that need to be taken to eliminate them. The state natural heritage staff, or a Forest Service natural resources advisor (as available) in consultation with the state natural heritage staff, shall visit the site in order to make this determination. If the project applicant accepts these recommendations, the agency administering the Scenic Area ordinance shall incorporate them into its development review order and the rare plant protection process may conclude.

(e) If emergency/disaster response activities occurred within a rare plant buffer zone that had adverse affects on rare plants or their buffer zone, the project applicant shall prepare a protection and rehabilitation plan, that meets the standards in GMA Guidelines 1

and 2, Protection and Rehabilitation Plans (Part I, Chapter 3: Natural Resources, Rare Plants).

(f) The agency conducting the post-emergency development review shall submit a copy of all protection and rehabilitation plans to the state heritage program for review. The state natural heritage program will have 15 days from the date the protection and rehabilitation plan is mailed to submit written comments to the agency conducting the post-emergency development review.

The agency conducting the post-emergency development review shall record any written comments submitted by the state natural heritage program in its development review order. Based on these comments, the agency shall make a final decision on whether the proposed use would be consistent with the rare plant policies and guidelines. If the final decision contradicts the comments submitted by the state natural heritage program, the agency conducting the post-emergency development review shall justify how it reached an opposing conclusion.

(g) The agency conducting the post-emergency development review shall require the project applicant to revise the protection and rehabilitation plan as necessary to ensure that the proposed use would not adversely affect a rate plant site.

D. Recreational Resources

(1) To the greatest extent practicable, emergency/disaster response actions shall not aversely affect recreational resources.

(2) Mitigation measures shall be implemented to mitigate any adverse effects on existing recreation resources caused by emergency/disaster response activities to the maximum extent practicable.

5. Post-Emergency Construction

A. The following review uses are allowed in all land use designations subject to compliance with the standards in Review Uses (Part II, Chapter 7: General Policies and Guidelines) and the standards for protection of scenic, cultural, natural and recreation resources (Part I, Chapters 1 through 4: Resource Protection and Enhancement):

(1) Placement of structures necessary for continued public safety and the protection of private property and essential public services damaged during an emergency/disaster event. This includes replacement of temporary structures erected during such events with permanent

structures performing an identical or related function. Land use applications shall be submitted within 12 months following an emergency/disaster event.

LAND DIVISIONS AND CLUSTER DEVELOPMENT

GMA/SMA Policies

1. In general, creation of a parcel, regardless of parcel size, shall be subject to the policies and guidelines in the Management Plan.

2. New land divisions in the SMA are not allowed, unless the creation of a new parcel will facilitate land acquisition by the federal government to achieve the policies and guidelines in the Management Plan.

GMA/SMA Guidelines

1. Unless otherwise specified, creation of a parcel, regardless of size, or any division of land shall be subject to the policies and guidelines in the Management Plan.

2. At the time of creation of one or more new parcels, consolidation of access shall be considered in order to reduce adverse effects on scenic, cultural, natural and recreation resources.

3. Where authorized in Part II of the Management Plan, a land division in the GMA may create parcels smaller than the designated minimum size and may include a bonus, as specified under Guideline 5 below, in order to cluster new dwellings. Approval of cluster development shall be contingent upon submission of plans specifying dwelling sites and areas of permanent, undeveloped open land. To approve a cluster development, the local government must find that clustering new dwellings will provide a siting opportunity not available through conventional parcel-by-parcel development. These opportunities include siting the new dwellings to:

    A. Be located in areas with screening vegetation or other features that reduce visibility of development as seen from key viewing areas.

    B. Avoid significant landscape features.

    C. Protect the existing character of the landscape setting.

    D. Reduce interference with movement of deer or elk in winter range.

    E. Avoid areas of known cultural resources.

F. Consolidate road access, septic drainfields, or other development features to reduce impacts associated with grading or ground disturbance.

G. Reduce adverse effects to riparian areas, wetlands, natural areas, rare plants, sensitive wildlife sites, or other natural resources.

H. Increase the likelihood of agricultural or forest management on the undeveloped land left by the cluster development.

4. In the GMA, following cluster development, there may be no further division of any resulting parcel for residential purposes until the subject parcel is included within the boundary of an Urban Area. The local government shall ensure permanent protection for open areas created by cluster development. No parcel in a cluster development may be smaller than 1 acre in a 5-acre Residential or 10-acre Residential designation or 2 acres in a Small-Scale Agriculture or Small Woodland designation.

5. In the GMA, cluster development may create up to 25 percent more parcels than otherwise allowed by the minimum parcel size on lands designated 5-acre Residential or 10-acre Residential and up to 50 percent more on lands designated Small-Scale Agriculture or Small Woodland. Any division in a cluster development under this guideline may create at least one additional parcel.

6. In the GMA, at least 75 percent of land subject to a cluster development shall be permanently protected as undeveloped land.

7. In the GMA, contiguous parcels in the same ownership or in separate ownership may be consolidated and redivided to take advantage of cluster development bonuses.

LOT LINE ADJUSTMENTS

GMA Policies

1. Lot line adjustments are intended to effect minor changes to existing parcel lines.

2. Lot line adjustments shall not increase the potential number of parcels in any subsequent land division over the number of parcels that could occur on the entirety of the affected parcels before a lot line adjustment.

3. Lot line adjustments shall not exempt an agency or landowner from the specified minimum parcel sizes for land divisions in the Management Plan.

4. Lot line adjustments shall not adversely affect scenic, cultural, recreation or natural resources.

5. Except in Agriculture-Special, Open Space, Public Recreation, or Commercial Recreation, lot line adjustments that would not result in the potential to create additional parcels through subsequent land divisions may be reviewed through the expedited development review process.

6. All other lot line adjustments shall be reviewed through the full development review process, including lot line adjustments that would result in the potential to create additional parcels through subsequent land divisions.

GMA Guidelines

1. Lot line adjustments for parcels in all land use designations except Agriculture-Special, Open Space, Commercial, Public Recreation, or Commercial Recreation shall comply with the following standards:

   A. The lot line adjustment shall not result in the creation of any new parcel(s).

   B. The lot line adjustment shall not result in the potential to create a new parcel(s) or residential development in excess of the minimum density allowed by the land use designation(s) for the affected parcels.

   C. The lot line adjustment shall not allow a parcel that is equal to or larger than the minimum parcel size before the lot line adjustment to become less than the minimum parcel size after the lot line adjustment**,** except to allow a public or non-profit entity to acquire land for the purpose of protecting and enhancing scenic, cultural, recreation or natural resources, provided the land to be acquired would be protected by a conservation easement or other similar property restriction that precludes future land divisions and development.

   D. The lot line adjustment shall not allow a parcel that is smaller than the minimum parcel size to be reduced in size, except to accomplish one of the following purposes:

      (1) Resolve boundary disputes, correct physical encroachments, provide reasonable access, or meet buffer or set back requirements, provided (1) the parcel to be enlarged would not become eligible for a subsequent land division and (2) the amount of land transferred would be the minimum necessary to resolve the issue.

      (2) Allow a public or non-profit entity to acquire land for the purpose of protecting and enhancing scenic, cultural, recreation or natural resources, provided the land to be acquired would be protected by a conservation easement or other similar property restriction that precludes future land divisions and development.

E. The lot line adjustment shall not allow the boundary of a parcel designated Large-Scale Agriculture, Agriculture-Special, Commercial Forest Land, Large Woodland or Open Space to be extended into another land use designation for the purpose of establishing a dwelling under less stringent guidelines (e.g., extending a parcel designated GMA Large-Scale Agriculture into a parcel designated Rural Center or Residential).

F. The lot line adjustment shall not allow previously approved parcels or developments to violate conditions of approval or become out of compliance or further out of compliance with existing land use and resource protection guidelines, including, but not limited to, requirements for buffer zones and landscaping.

G. The lot line adjustment shall not result in a parcel that cannot comply with existing land use and resource protection guidelines, including, but not limited to requirements for buffer zones and landscaping.

2. Lot line adjustments for parcels designated Agriculture-Special or Open Space shall comply with the following standards:

   A. The lot line adjustment may be allowed upon demonstration that it is necessary to facilitate efforts to protect and enhance scenic, cultural, natural, or recreation resources. (Note: There is no specified minimum parcel size for parcels designated Open Space.)

   B. The lot line adjustment shall comply with Guidelines 1.A, 1.E, 1.F, and 1.G above.

3. Lot line adjustments for parcels designated Commercial shall comply with Guidelines 1.A, 1.E, 1.F, and 1.G above.

4. Lot line adjustments for parcels designated Public Recreation or Commercial Recreation shall comply with the following standards:

   A. The lot line adjustment may be allowed upon demonstration that it is necessary to facilitate, enhance, or otherwise improve recreation uses on the parcel. (Note: There are no specified minimum parcel sizes for parcels designated Public Recreation or Commercial Recreation.)

   B. The lot line adjustment shall comply with Guidelines 1.A, 1.E, 1.F, and 1.G above.

SMA Policies

1. Lot line adjustments are intended to effect minor changes to existing parcel lines.

2. Lot line adjustments shall comply with National Scenic Area Act provisions requiring residences to be sited or constructed on parcels 40 acres or greater. Lot line

adjustments shall not increase the potential number of new residences in the Special Management Area, in that lot line adjustments shall not result in a parcel less than 40 acres becoming 40 acres or greater. Lot line adjustments shall not result in a parcel greater than or equal to 40 acres with a dwelling becoming less than 40 acres.

SMA Guidelines

1. The proposed lot line adjustment shall not result in the creation of any new parcel(s).

2. A lot line adjustment shall not result in a parcel greater than or equal to 40 acres becoming less than 40 acres.

3. A lot line adjustment shall not result in a parcel less than 40 acres becoming 40 acres or greater.

4. A parcel that is smaller than 40 acres shall not be reduced in size, except to accomplish one of the following purposes:

   A. Resolve boundary line disputes, correct physical encroachments, provide reasonable access, or meet buffer or set back requirements, provided (1) the parcel to be enlarged would not become 40 acres or greater and (2) the amount of land transferred would be the minimum necessary to resolve the issue.

   B. Allow a public or non-profit entity to acquire land for the purpose of protecting and enhancing scenic, cultural, recreation or natural resources, provided the land to be acquired would be protected by a conservation easement or other similar property restriction that precludes residential development.

5. The lot line adjustment shall not cause previously approved parcels or development to violate conditions of approval or become out of compliance or further out of compliance with existing land use and resource protection guidelines, including, but not limited to, requirements for buffer zones and landscaping.

6. The lot line adjustment shall not result in a parcel that cannot comply with existing land use and resource protection guidelines, including, but not limited to requirements for buffer zones and landscaping.

AGRICULTURAL BUILDINGS

GMA/SMA Guidelines

1. The size of proposed agricultural buildings shall not exceed the size needed to serve the current agricultural use and, if applicable, the proposed agricultural use.

2. To satisfy Guideline 1, applicants shall submit the following information with their land use application:

   A. A description of the size and characteristics of current agricultural use.

   B. An agricultural plan for any proposed agricultural use that specifies agricultural use (e.g., crops, livestock, products), agricultural areas and acreages (e.g., fields, pastures, enclosures), agricultural structures (e.g., irrigation systems, wind machines, storage bins) and schedules (e.g., plowing, planting, grazing).

   C. A floor plan showing intended uses of the agricultural building (e.g., space for equipment, supplies, agricultural products, livestock).

TEMPORARY USE--HARDSHIP DWELLING

GMA/SMA Guidelines

1. A permit for the temporary placement of a mobile home may be granted under the following circumstances:

   A. A family hardship exists where conditions relate to the necessary care for a member of the family occupying the principal dwelling and where medical conditions relate to the infirm or aged.

   B. The hardship dwelling will use the same subsurface sewage disposal system used by the existing dwelling, if the system is adequate to accommodate the additional dwelling, unless the additional dwelling can use an existing public sanitary sewer system.

   C. The hardship dwelling is found to be consistent with the guidelines for protection of scenic, cultural, natural, and recreation resources.

2. A permit may be issued for a 2-year period, subject to annual review for compliance with the provisions of this section and any other conditions of approval.

3. Upon expiration of the permit or cessation of the hardship, whichever comes first, the mobile home shall be removed within 30 days.

4. A new permit may be granted upon a finding that a family hardship continues to exist.

SEWER AND WATER SERVICES

GMA/SMA Policies

1. Sewer lines may be extended from an Urban Area into a rural area to serve:

   A. Areas with a documented health hazard.

   B. Recreation uses open to the public, only upon a demonstration by the local government that there is no practicable alternative to providing service to the area. In such cases, the lines shall be engineered and sized solely to serve the defined area or use. Such lines shall not be relied upon as the sole justification for revision to an Urban Area boundary.

2. New uses authorized in the Management Plan may hook up to existing sewer and water lines in rural areas.

DOCKS AND BOATHOUSES

GMA/SMA Policies

1. Multiple uses of docks on the Columbia River and its tributaries shall be encouraged. Private, single-purpose docks shall be discouraged.

2. New docks shall be consistent with applicable guidelines for protection of scenic, cultural, natural, and recreation resources.

GMA/SMA Guidelines

1. New, private docks and boathouses serving only one family and one property shall be allowed, up to 120 square feet in size.

2. New, private docks and boathouses serving more than one family and property shall be allowed, up to 200 square feet in size.

3. Public docks open and available for public use shall be allowed.

4. Boathouses may be allowed under Guidelines 1 and 2 above only when accessory to a dwelling and associated with a navigable river or lake.

HOME OCCUPATIONS AND COTTAGE INDUSTRIES

GMA/SMA Policy

1. Small-scale cottage industries or commercial use associated with residential use shall be allowed, subject to guidelines to minimize adverse effects on scenic, cultural, natural, and recreation resources.

GMA/SMA Guidelines

1. Home occupations and cottage industries may be established as authorized in specified land use designations consistent with the following conditions:

    A. A home occupation may employ only residents of the home.

    B. A cottage industry may employ up to three outside employees.

    C. No more than 25 percent of the total actual living space of the dwelling may be used for the home occupation or cottage industry.

    D. No more than 500 square feet of an accessory structure may be used for a home occupation or cottage industry.

    E. There shall be no outside, visible evidence of the home occupation or cottage industry, including outside storage.

    F. Exterior structural alterations to the residence for the home occupation or cottage industry shall not be permitted. New structures shall not be constructed for the primary purpose of housing a home occupation or cottage industry.

    G. No retail sales may occur on the premises, except incidental sales at lodging establishments authorized in this chapter.

    H. One non-animated, non-illuminated sign, not exceeding 2 square feet in area, may be permitted on the subject structure or within the yard containing the home occupation or cottage industry.

    I. Parking not associated with residential use shall be screened so it is not visible from key viewing areas.

    J. A bed and breakfast lodging establishment that is two bedrooms or less is considered a home occupation and shall meet the guidelines for "Bed and Breakfast Inns," below, except for Policy 3.

BED AND BREAKFAST INNS

GMA/SMA Policies

1. Bed and breakfast inns associated with residential use shall be allowed, subject to guidelines to minimize adverse effects on scenic, cultural, natural, and recreation resources.

2. Bed and breakfast inns shall remain rural in character and scale and distinct from motels or restaurants, which can locate in Urban Areas.

3. In the SMA, bed and breakfast inns associated with residential use shall be allowed only in structures that are included in, or eligible for inclusion in, the National Register of Historic Places.

GMA/SMA Guidelines

1. Bed and breakfast inns may be established as authorized in specified land use designations, consistent with the following conditions:

    A. Guests may not occupy a facility for more than 14 consecutive days.

    B. One non-animated, non-illuminated sign, not exceeding 4 square feet in area, may be permitted on the structure or within the yard containing the structure.

    C. Parking areas shall be screened so they are not visible from key viewing areas.

SMALL-SCALE FISHING SUPPORT AND FISH PROCESSING OPERATIONS

GMA Policies

1. Fishing is a historic natural resource based industry in the National Scenic Area. For the purpose of supporting family-based commercial fishing businesses associated with residential use, small-scale fishing support and fish processing operations may be allowed, subject to compliance with the applicable land use, treaty rights and resource protection guidelines.

2. Small-scale fishing support and fish processing operations may be allowed in the following land use designations on parcels that are contiguous with and have direct access to the Columbia River: GMA Residential, GMA Small Woodland, and GMA Small-Scale Agriculture.

GMA Guidelines

1. Small-scale fishing support and fish processing operations in conjunction with a family-based commercial fishing business may be allowed on parcels designated GMA Residential, GMA Small Woodland, or GMA Small-Scale Agriculture, subject to the following conditions:

    A. In addition to the guidelines specified in Part II, Land Use Designations, the operation shall comply with the guidelines for "Treaty Rights and Consultation in the GMA" (Part IV, Chapter 3, Indian Tribal Treaty Rights and Consultation), "Approval Criteria for Fire Protection" (Part II, Chapter 2, Forest Land), and "Approval Criteria for Siting of Dwellings on Forest Land" (Part II, Chapter 2, Forest Land).

    B. The following fishing support activities may be allowed: maintenance, repair, and storage of boats, nets, fish totes and other commercial fishing equipment that is used in the family-based commercial fishing business; and garaging of fish hauling trucks, trailers and all other related equipment that is used in the family-based commercial fishing business.

    C. The following fish processing activities may be allowed: cleaning, gutting, heading, and icing or freezing of fish that is caught by the family-based commercial fishing business. Other fish processing activities shall not be allowed, including, but not limited to, canning, smoking, salting or brining for wholesale or retail sale.

    D. The operation shall be located on a lawful parcel that is contiguous with and has direct access to the Columbia River.

    E. The subject parcel shall include a lawful dwelling, and the permanent resident of the dwelling shall participate in the fishing support and fish processing operation.

    F. The operation may only employ residents of the dwelling and up to three outside employees.

    G. No more than 25 percent of the total actual living space of the dwelling may be used for the fishing support and fish processing operation.

    H. The operation may take place in an existing or new lawful accessory building or an existing agricultural building on the subject parcel. A new building constructed for the purpose of housing a fishing support and fish processing operation shall be considered an accessory building. An existing agricultural building shall not be expanded and a new agricultural building shall not be constructed for the purpose of housing a fishing support and fish processing operation.

I. An accessory building used in the fishing support and fish processing operation may be allowed up to 2,500 square feet.

J. Docks may be allowed as follows:

(1) One dock serving a parcel with an approved fishing support and fish processing operation may be allowed up to 500 square feet in size.

(2) For multiple contiguous parcels each with approved fishing support and fish processing operation, the area of the docks authorized in J(1) above may be combined into one dock, provided the total size of the dock shall not exceed 2,000 square feet.

K. There shall be no outside visible evidence of the fishing support and fish processing operation, including storage, other than boats and docks.

L. No retail sales may occur on the parcel.

M. The operation shall only support and process fish caught by residents of the dwelling and up to three outside employees.

N. Before beginning the operation, applicants shall demonstrate that they have obtained and complied with federal, state and/or local water quality and wastewater permits.

RESOURCE ENHANCEMENT PROJECTS

GMA/SMA Guidelines

1. Applications for resource enhancement projects must describe the goals and benefits of the proposed enhancement project. They must also thoroughly document the condition of the resource before and after the proposed enhancement project.

2. In addition to other guidelines that protect scenic, cultural, recreation, and natural resources, quarry enhancement projects shall comply with the following guidelines:

A. Application Requirements. In addition to other applicable requirements, land use applications for quarry enhancement projects shall include perspective drawings of the site as seen from key viewing areas as specified in GMA Key Viewing Area Guideline 15 and a reclamation plan that provides all the applicable information specified in GMA Overall Scenic Provisions Guidelines 6.A through 6.E (Part I, Chapter 1), except (1) the words "pre-reclamation" and "post-reclamation" should replace the words "pre-mining" and "post-

mining," respectively, and (2) the appropriate state agency or local government does not have to approve the reclamation plan.

B. Scenic Resource Standard. Quarry enhancement projects shall restore the site to a natural appearance that blends with and emulates surrounding landforms to the maximum extent practicable.

C. Natural Resource Standard. Sites shall be replanted using native plants found in the landscape setting or ecoregion to the maximum extent practicable.

D. Time Frames. The following time frames shall apply to quarry enhancement projects:

(1) All grading (e.g., excavating, filling and re-contouring) shall be completed within one (1) year of the date an applicant begins on-the-ground work.

(2) All landscaping shall be planted within one (1) year of the date an applicant completes the grading.

(3) An applicant may request one one-year extension to the one year grading time frame if a project is unexpectedly delayed by adverse weather or emergency/disaster. Such requests shall be considered an administrative action. An applicant shall submit such a request to the reviewing agency after grading has commenced and before the one year grading time frame has expired.

(4) An applicant may also request one six-month extension to the one (1) year landscaping time frame if a project is unexpectedly delayed by adverse weather or emergency/disaster. Such requests shall be considered an administrative action. An applicant shall submit such a request to the reviewing agency after landscaping has commenced and before the one-year landscaping time frame has expired.

DISPOSAL SITES FOR SPOIL MATERIALS FROM PUBLIC ROAD MAINTENANCE ACTIVITIES

GMA/SMA Guidelines

1. Application Requirements. In addition to other applicable requirements, land use applications for disposal sites shall include the same information that applicants are required to submit for expansion of existing quarries and production and/or development of mineral resources in the GMA, including, but not limited to:

A. A reclamation plan that provides all the applicable information specified in GMA Overall Scenic Provisions Guidelines 6.A through 6.E (Part I, Chapter 1:

Scenic Resources), except (1) the words “pre-reclamation” and “post-reclamation” should replace the words “pre-disposal” and “post-disposal” and (2) the appropriate state agency or local government does not have to approve the reclamation plan.

B. Perspective drawings of the site as seen from key viewing areas as specified in GMA Key Viewing Area Guideline 15 (Part I, Chapter 1: Scenic Resources).

C. Cultural resource reconnaissance and historic surveys, as required by GMA Cultural Resources Policies 6 and 7 (Part I, Chapter 2: Cultural Resources). Disposal sites shall be considered a “large-scale use” according to GMA Cultural Resources Policy 8.

D. Field surveys to identify sensitive wildlife areas or sites and sensitive plants [see GMA “Site Plans and Field Surveys for Review Uses Near Sensitive Wildlife Areas and Sites” Guidelines 1 and 2, and “Site Plans and Field Surveys for Review Uses Near Sensitive Plants” Guidelines 1 and 2 (Part I, Chapter 4: Natural Resources)].

2. Siting Standard. The proposed disposal site shall only be approved if the applicant demonstrates it is not practicable to locate the disposal site outside the Scenic Area or inside an Urban Area. At a minimum, the applicant shall submit a feasibility and suitability analysis that compares the proposed disposal site to existing or potential disposal sites located both outside the Scenic Area and inside an Urban Area.

3. Scenic Resource Standards. Disposal sites shall comply with the same scenic resources protection standards as expansion of existing quarries and production and/or development of mineral resources in the GMA, including, but not limited to:

A. Sites more than 3 miles from the nearest key viewing area shall be visually subordinate as seen from any key viewing area, according to GMA Key Viewing Area Guideline 27 (Part I, Chapter 1: Scenic Resources).

(1) An interim period to achieve compliance with this requirement shall be established before approval. The period shall be based on site-specific topographic and visual conditions, but shall not exceed 3 years beyond the start of on-the-ground activities.

B. Sites less than 3 miles from the nearest key viewing area shall be fully screened from any key viewing area, according to GMA Key Viewing Area Guideline 28 (Part I, Chapter 1: Scenic Resources).

(1) An interim period to achieve compliance with this requirement shall be established before approval. The period shall be based on site-specific topographic and visual conditions, but shall not exceed 1 year beyond the start of on-the-ground activities. Disposal activity occurring before

achieving compliance with full screening requirements shall be limited to activities necessary to provide such screening (creation of berms, etc.).

C. Reclamation plans shall restore the site to a natural appearance that blends with and emulates surrounding landforms and vegetation patterns to the maximum extent practicable.

COMMERCIAL EVENTS

GMA Guidelines

1. Commercial events include weddings, receptions, parties and other small-scale gatherings that are incidental and subordinate to the primary use on a parcel.

2. Commercial events may be allowed in the GMA except on lands designated Open Space, Commercial Forest, or Agriculture-Special, subject to compliance with the following conditions and the scenic, cultural, natural and recreation resources guidelines:

   A. The use must be in conjunction with a lawful winery, wine sales / tasting room, bed and breakfast inn, or commercial use. If the use is proposed on a property with a building on or eligible for the National Register of Historic Places, it shall be subject to the guidelines in “Special Uses in Historic Buildings” (Part II, Chapter 7: General Policies and Guidelines), and not the guidelines of this section.

   B. The owner of the subject parcel shall live on the parcel and shall operate and manage the use.

   C. A single commercial event shall host no more than 100 guests.

   D. The use shall comply with the following parking requirements:

      (1) A single commercial event shall include no more than 50 vehicles for guests.

      (2) All parking shall occur on the subject parcel.

      (3) At least 200 square feet of parking space shall be required for each vehicle.

      (4) Parking areas may be developed using paving blocks, gravel, or other pervious surfaces; asphalt, concrete and other imperious materials shall be prohibited.

      (5) All parking areas shall be fully screened from key viewing areas.

E. The owner of the subject parcel may conduct 18 single events up to one day in length per year.

F. The owner of the subject parcel shall notify the reviewing agency and all owners of land within 500 feet of the perimeter of the subject parcel of each planned event. The notice shall be in writing and shall be mailed at least seven calendar days before an event.

G. Tents, canopies, portable restrooms and other similar temporary structures necessary for a commercial event may be allowed, provided all such structures are erected or placed on the subject parcel no more than two days before the event and removed no more than two days after the event. Alternatively, temporary structures may remain in place for up to 90 days if they are fully screened from key viewing areas.

H. The use may be allowed upon demonstration that the following conditions exist to protect any nearby agricultural and forest operations:

(1) The use would not force a change in or increase the cost of accepted agricultural practices on surrounding lands [GMA Guideline 1.Q(1), Review Uses, Part II, Chapter 1: Agricultural Land].

(2) The use would be set back from any abutting parcel designated Large-Scale or Small-Scale Agriculture, as required "Agricultural Buffer Zones," or designated Commercial Forest Land or Large or Small Woodland, as required in the "Siting of Dwellings on Forest Land." [Guideline 1.Q(3), Review Uses, Part II, Chapter 1: Agricultural Land].

(3) A declaration has been signed by the landowner and recorded into county deeds and records specifying that the owners, successors, heirs and assigns of the subject parcel are aware that adjacent and nearby operators are entitled to carry on accepted agriculture or forest practices on lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland [GMA Guideline 1.Q(4), Review Uses, Part II, Chapter 1: Agricultural Land].

(4) All owners of land in areas designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland that is within 500 feet of the perimeter of the subject parcel on which the use is proposed to be located have been notified and given at least 10 days to comment prior to a decision. [GMA Guideline 1.Q(5), Review Uses, Part II, Chapter 1: Agricultural Land].

I. Counties may impose additional requirements to address potential impacts to surrounding neighbors. For example, they may limit noise, lighting and operating hours.

J. Land use approvals for commercial events shall not be valid for more than two years. Landowners must reapply for the use after a land use approval expires.

INDUSTRIAL DEVELOPMENT

GMA/SMA Policy

1. New industrial development shall not be allowed in the Scenic Area outside Urban Areas.

VARIANCES FROM SETBACKS AND BUFFERS

GMA Policies

1. When setbacks or buffers specified in the guidelines for protection of scenic, cultural, natural, recreation, agricultural, or forestry resources overlap or conflict, they should be varied in a manner to achieve, to the greatest extent possible, the overall protection of the affected resources.

2. Setbacks and buffers specified in the guidelines for protection of scenic, cultural, natural, recreation, agricultural, or forestry resources shall not be applied in the GMA in a manner that deprives the owner of a parcel of land the opportunity to establish a residence on the land if that opportunity is otherwise authorized by the land use designation.

GMA Guidelines

1. When setbacks or buffers specified in the guidelines for the protection of scenic, cultural, natural, recreation, agricultural, or forestry resources overlap or conflict, the setbacks or buffers may be varied upon a demonstration that both of the following conditions exist:

   A. A setback or buffer specified in the Management Plan to protect one resource would cause the proposed use to fall within a setback or buffer specified in the plan to protect another resource.

   B. Variation from the specified setbacks or buffer would, on balance, best achieve the protection of the affected resources.

2. A setback or buffer specified in the guidelines for protection of scenic, cultural, natural, recreation, agricultural, or forestry resources may be varied in the GMA to allow a residence to be built on a parcel of land upon a demonstration that all of the following conditions exist:

A. The land use designation otherwise authorizes a residence on the tract.

B. No site exists on the tract (all contiguous parcels under the same ownership) on which a residence could practicably be placed in full compliance with the setback or buffer.

C. The variance from the specified setback or buffer is the minimum necessary to allow the residence.

VEGETATION CONTROL METHODS

GMA/SMA Policy

1. State and county highway right-of-way managers should use vegetation control methods that have the least adverse effect on soils, native plant populations, riparian areas, wetlands, and wildlife habitat.

REVIEW USES

GMA/SMA Policies

1. Review uses are those uses subject to applicable guidelines for protection of scenic, cultural, natural, recreation, agricultural, and forestry resources and such other guidelines as are specified in the Management Plan. Conditions are often applied to new review uses.

2. Local governments shall notify the four Indian tribal governments, the appropriate state, the Gorge Commission, and the Forest Service of all land use applications that involve land divisions; residential, commercial or industrial development; or the exploration, development, or production of mineral resources.

3. Uses by state or federal agencies shall comply with the policies and guidelines in the Management Plan.

4. The Forest Service shall review and issue a determination of consistency with the Management Plan for projects on federal lands. The Forest Service shall review land use and development actions of federal agencies for consistency with the Management Plan. Federal resource specialists will provide resource review for projects on federal lands.

5. Land use applications for review uses shall include a site plan and elevation drawings that provide complete, detailed information about a proposed use.

6. Land use applications for review uses involving more than 100 cubic yards of grading with slopes greater than 10 percent, except trails in the SMA, shall include a grading plan.

7. Recreation sites shall be protected from adjacent uses that would detract from their use and enjoyment.

GMA/SMA Guidelines

1. Conditions attached to approval of uses shall be recorded in county deeds and records to ensure notice of the conditions to successors in interest.

2. The Gorge Commission and the Forest Service shall add new resource information to their inventories as soon as it becomes available and shall provide the information to local governments for use in review of proposed projects.

3. All site plans shall include the information listed below. As specified in the guidelines of the Management Plan, supplemental information shall be required for (1) forest practices in the SMA, (2) production and development of mineral resources in the GMA, (3) proposed uses visible from key viewing areas, and (4) proposed uses located near cultural resources, wetlands, streams, ponds, lakes, riparian areas, sensitive wildlife habitat, and sensitive plant sites.

   A. Project applicant's name and address.

   B. Location of the proposed use, including township, range, section, county, and tax lot number.

   C. A written description of the proposed use, including details on the height, exterior color(s), and construction materials of proposed structures.

   D. A list of key viewing areas from which the proposed use would be visible.

   E. A map of the project area. The map shall be drawn to scale. The scale of the map shall be large enough to allow the reviewing agency to determine the location and extent of the proposed use and evaluate its effects on scenic, cultural, natural, and recreation resources. The map shall be prepared at a scale of 1 inch equals 200 feet (1:2,400), or a scale providing greater detail. If a parcel is very large, the map does not have to show the entire parcel. Rather, it can show only those portions of the parcel affected by the proposed use. The map shall include the following elements:

      (1) North arrow.

      (2) Map scale.

(3) Boundaries, dimensions, and size of the subject parcel.

(4) Significant terrain features or landforms.

(5) Groupings and species of trees and other vegetation on the parcel.

(6) Location and species of vegetation that would be removed or planted.

(7) Bodies of water and watercourses.

(8) Location and width of existing and proposed roads, driveways, and trails.

(9) Location and size of existing and proposed structures.

(10) Location of existing and proposed services, including wells or other water supplies, sewage disposal systems, power and telephone poles and lines, and outdoor lighting.

(11) Location and depth of all proposed grading and ditching.

4. Elevation drawings shall show the appearance of proposed structures and shall include natural grade, finished grade, and the geometrical exterior of at least the length and width of structures as seen from a horizontal view. Elevation drawings shall be drawn to scale.

5. In the General Management Area, all applications for structural development involving more than 100 cubic yards of grading with slopes greater than 10 percent shall include a grading plan. In the Special Management Area, all applications for structural development involving more than 100 cubic yards of grading with slopes greater than 10 percent (except trails) shall include a grading plan. Grading plans shall include the following:

A. A map of the site, prepared at a scale of 1 inch equals 200 feet (1:2,400) or a scale providing greater detail, with contour intervals of at least 5 feet, including:

(1) Natural and finished grades.

(2) Location of all areas to be graded, with cut banks and fill slopes delineated.

(3) Estimated dimensions of graded areas.

B. A narrative description (may be submitted on the grading plan site map and accompanying drawings) of the proposed grading activity, including:

(1) Its purpose.

(2) An estimate of the total volume of material to be moved.

(3) The height of all cut banks and fill slopes.

(4) Provisions to be used for compactions, drainage, and stabilization of graded areas. (Preparation of this information by a licensed engineer or engineering geologist is recommended.)

(5) A description of all plant materials used to revegetate exposed slopes and banks, including the species, number, size, and location of plants, and a description of irrigation provisions or other measures necessary to ensure the survival of plantings.

(6) A description of any other interim or permanent erosion control measures to be used.

6. A review use may be allowed only pursuant to a process that provides at least the following:

   A. Notice of the land use application or notice of the initial decision to landowners within 200 feet of the perimeter of the subject parcel unless a greater distance is specified in the Management Plan.

   B. Notice of the land use application to the Forest Service and the Gorge Commission.

   C. An opportunity to request a hearing.

   D. A written decision with findings of fact and conclusions of law.

7. Where local governments have no regulatory authority over state and federal actions, the Forest Service and Gorge Commission shall develop agreements with applicable state, bi-state, or federal agencies for review of the agencies' project proposals.

8. If new buildings or structures may detract from the use and enjoyment of established recreation sites on adjacent parcels, an appropriate buffer shall be established between the building/structure and the parcel.

SMA SIGN PROVISIONS

SMA Goal

Allow signs in the SMA that meet the functional needs for which they are designed while minimizing scenic impacts.

SMA Policies

1. All public signs subject to review located in the SMA must be designed and located in compliance with the standards described in the Columbia River Gorge National Scenic Area Graphic Signing System and must conform to the standards contained in the Manual for Uniform Traffic Control Devices.

2. New signs shall meet the minimum provisions of these guidelines in all cases where these provisions do not conflict with other regulations intended for public safety and information.

SMA Guidelines

1. New signs shall be allowed as specified in the applicable land use designation.

2. No sign shall be erected or placed in such a manner that it may interfere with, be confused with, or obstruct the view of any traffic sign, signal, or device.

3. Preexisting signs are allowed to continue, provided no changes occur in size, structure, color, or message.

4. Except for signs allowed without review pursuant to Part II, Chapter 7: General Policies and Guidelines, all new signs shall meet the following guidelines and be consistent with the Manual for Uniform Traffic Control Devices:

    A. Signs shall be maintained in a neat, clean, and attractive condition.

    B. The character and composition of sign materials shall be harmonious with the landscape and/or related to and compatible with the main structure upon which the sign is attached.

    C. Signs shall be placed flat on the outside walls of buildings, not on roofs or marquees.

    D. Signs shall be unobtrusive and have low contrast with the setting.

    E. The visual impact of the support structure shall be minimized.

    F. Outdoor sign lighting shall be used for purposes of illumination only, and shall not be designed for, or used as, an advertising display, except for road safety signs.

    G. The backs of all signs shall be visually unobtrusive, non-reflective, and blend in with the setting.

H. Internal illumination or backlighting of signs shall not be permitted except for highway construction, warning, or safety.

5. Public signs shall meet the following standards in addition to Guidelines 1 through 4 of this section:

   A. The Graphic Signing System provides design standards for public signs in and adjacent to public road rights-of-way. All new and replacement public signs, except those transportation regulatory, guide, and warning signs allowed outright shall conform to the guidelines in this system. Types of signs addressed include recreation site entry, interpretive, specific service signs, destination and distance signs, variable message signs, or signs that bridge or are cantilevered over the road surface.

   B. Signs located outside public road rights-of-way are encouraged to be designed in a way that is consistent with similar-purpose signs described in the Graphic Signing System.

   C. Signs posted by governmental jurisdictions giving notice to the public shall be no larger than that required to convey the intended message.

6. Signs for public and commercial recreation facilities, home occupations, cottage industries, and commercial uses shall meet the following guidelines in addition to Guidelines 1 through 4 and 7 of this section:

   A. Any sign advertising or relating to a business that is discontinued for a period of 30 consecutive days shall be presumed to be abandoned and shall be removed within 30 days thereafter, unless permitted otherwise by the jurisdictional authority.

   B. Any signs relating to or advertising for a business shall be brought into conformance with these sign guidelines before any expansion or change in use that is subject to review by the counties.

   C. Offsite and onsite directional signs on approach roads to recreational facilities may be permitted. Name and interpretive signs may be permitted onsite, but should be kept to the minimum required to achieve the purpose(s) of the facilities.

   D. Commercial recreation businesses approved in conjunction with a recreational facility may have a name sign not exceeding 16 square feet.

   E. Recreation developments may have one on-premise name sign at each principal entrance. Such signs are encouraged to be of a low profile, monument type, and shall conform to the Graphic Signing System.

7. The following signs are prohibited:

    A. Advertising billboards.

    B. Signs that move or give the appearance of moving, except signs used for highway construction, warning, or safety.

    C. Portable or wheeled signs, or signs on parked vehicles where the sign is the primary use of the vehicle, except for signs used for highway construction, warning, or safety.

8. Sign clutter and other negative visual effects from excessive signs along all roads and highways, and at parking lots and recreation facilities, shall be reduced.

COLUMBIA RIVER BRIDGE REPLACEMENT

GMA Goal

1. Ensure that a replacement Columbia River Bridge between the Hood River and Bingen/White Salmon Urban Areas provides for regional transportation and public safety needs while being consistent with both purposes of the Scenic Area Act.

GMA Guidelines

Visual Quality

1. A replacement Columbia River Bridge between the Hood River and Bingen/White Salmon Urban Areas shall be visually unobtrusive and harmonious with the surrounding Gorge landscape and the Columbia River. A replacement bridge shall:

    A. Utilize recessive dark natural or earth-tone colors for steel components of the bridge, a thin and open structural design that allows views through it to the extent practicable, and consistent design character and ornamental elements;

    B. Employ lighting that provides a safe and pleasant atmosphere for bicycles and pedestrians while not casting glare directly into the sky or onto the river.

Historic Design Elements

1. A replacement Columbia River Bridge between the Hood River and Bingen/White Salmon Urban Areas shall incorporate elements that reflect historic design features of Scenic Area roadways and bridges. The historic themes should be an integral component of the design of the bridge structure, incorporated from “shore to shore.”

2. A replacement bridge should include:

A. Arches and/or other traditional structural forms in the bridge;

B. Historic style benches, lighting, other pedestrian furnishings, and signage/graphic materials consistent with the USFS Graphic Signing System for the Scenic Area;

C. Ornamental concrete or steel railings.

Recreation and Pedestrian/Bicycle Access

1. A replacement Columbia River Bridge between the Hood River and Bingen/White Salmon Urban Areas shall encourage and promote pedestrian and bicycle use, for recreational enjoyment and to enhance multi-modal transportation connections between the Urban Areas it connects.

2. The bridge shall include facilities for pedestrians and bicyclists that:

   A. Are permanent;

   B. Are wide enough to safely accommodate and encourage walking, bicycling, and other uses;

   C. Meet safety standards to prevent conflicts among automobiles, trucks, pedestrians, bicyclists, and other users;

   D. Provide multiple sitting and viewing areas with significant upstream and downstream views;

   E. Are safe to approach from both the north and south ends of the bridge and provide strong multi-modal connections, both east-west and to the nearby Urban Areas.

SPECIAL USES IN HISTORIC BUILDINGS

GMA Guidelines

Additional Review Uses for Historic Buildings

1. Properties in all GMA land use designations except Open Space and Agriculture-Special with buildings included on the National Register of Historic Places shall be permitted to be open for public viewing, interpretive displays, and an associated gift shop that is no larger than 100 square feet and incidental and subordinate to the primary use of the property, subject to compliance with the applicable guidelines to protect scenic, cultural, natural and recreation resources and the following sections of the “Additional Resource Protection Guidelines for Uses in Historic Buildings”: Cultural Resources Guidelines (2)(a) and (b), (3), (4) and (5); and all Scenic, Recreation, Agriculture and Forest Lands Guidelines. Voluntary

donations and/or fees to support maintenance, preservation and enhancement of the cultural resource may be accepted by the landowner.

2. Properties in all GMA land use designations except Open Space and Agriculture-Special with buildings included on the National Register of Historic Places, and which were former restaurants and/or inns shall be permitted to re-establish these former uses, subject to compliance with the applicable guidelines to protect scenic, cultural, natural and recreation resources and the following sections of the "Additional Resource Protection Guidelines for Uses in Historic Buildings": Cultural Resources Guidelines (2)(a) and (b), (3), (4) and (5); and all Scenic, Recreation, Agriculture and Forest Lands Guidelines. The capacity of restaurant use and overnight accommodations shall be limited to that existing in the former use, and the former use shall be contained within the limits of the building as of January 1, 2006. Banquets, private parties and other special events that take place entirely within an approved restaurant facility shall be considered a restaurant use allowed under this section.

3. Properties in all GMA land use designations except Open Space and Agriculture-Special with buildings included on the National Register of Historic Places shall be permitted to hold commercial events, subject to compliance with the applicable guidelines to protect scenic, cultural, natural and recreation resources and the following sections of the "Additional Resource Protection Guidelines for Uses in Historic Buildings": Cultural Resources Guidelines (2) through (5); and all Scenic, Recreation, Agriculture and Forest Lands Guidelines.

4. The following additional review uses may be allowed in all GMA land use designations except Open Space and Agriculture-Special on a property with a building either on or eligible for the National Register for Historic Places and that was 50 years old or older as of January 1, 2006, subject to compliance with the applicable guidelines to protect scenic, cultural, natural and recreation resources and "Additional Resource Protection Guidelines for Uses in Historic Buildings":

   A. Establishments selling food and/or beverages, limited to historic buildings that originally had kitchen facilities. The seating capacity of such establishments shall be limited to the building, as the building existed as of January 1, 2006, including any decks, terraces or patios also existing as of that date. Banquets, private parties and other special events that take place entirely within approved establishments selling food and/or beverages shall be considered a part of the approved use.

   B. Overnight accommodations. The room capacity of such accommodations shall be limited to the total number of existing rooms in the historic building as of January 1, 2006.

   C. Commercial events in the building or on the subject property, incidental and subordinate to the primary use of the property.

D. Wineries upon a showing that processing of wine is from grapes grown on the subject parcel or the local region, within a historic building, as the building existed as of January 1, 2006.

E. Sales/tasting rooms in conjunction with an on-site winery, within a historic building, as the building existed as of January 1, 2006.

F. Conference and/or retreat facilities within a historic building, as the building existed as of January 1, 2006.

G. Artist studios and galleries within a historic building, as the building existed as of January 1, 2006.

H. Gift shops within a historic building, as the building existed as of January 1, 2006 that are:

(1) incidental and subordinate to another approved use included in Guideline 4 of "Additional Review Uses for Historic Buildings"; and

(2) no larger than 100 square feet in area.

I. Interpretive displays, picnic areas or other recreational day use activities on the subject property.

J. Parking areas on the subject property to support any of the above uses.

5. For the purposes of the guidelines in this section, the term "historic buildings" refers to buildings either on or eligible for the National Register of Historic Places. Eligibility for the National Register shall be determined pursuant to Cultural Resources Guideline 1 of "Additional Resource Protection Guidelines for Uses in Historic Buildings."

6. Uses 3 and 4.C are not subject to the "Commercial Events" provisions in Part II, Chapter 7: General Policies and Guidelines of the Management Plan. Commercial events at historic properties will be regulated by the guidelines contained in this section. Applications for commercial events shall include all information in the "Operational Plan for Commercial Events" as specified in Guideline 1.A(2)(d) of "Additional Resource Protection Guidelines for Historic Buildings". The following apply to commercial events at historic properties:

A. Commercial events include weddings, receptions, parties and other gatherings that are incidental and subordinate to the primary use on a parcel.

B. The owner of the subject property shall notify the reviewing agency and all owners of land within 500 feet of the perimeter of the subject property of each

event. The notice shall be in writing and shall be mailed at least seven calendar days before an event.

7. Uses 1 and 4.I. are not subject to the parking limits and associated "Facility Design Guidelines" in the Recreation Intensity Classes.

8. Counties may impose additional requirements to address health, safety, and potential impacts to surrounding properties. For example, they may limit noise, parking, traffic, lighting and operating hours.

9. Land use approvals for special uses in historic buildings shall be subject to review by the local government every five years from the date the original approval was issued. As part of this review, the applicant shall submit documentation to the local government on the progress made in implementing the "Protection and Enhancement Plan" required in Cultural Resources Guideline (2) of "Additional Resource Protection Guidelines for Uses in Historic Buildings". The local government shall submit a copy of the applicant's documentation to the State Historic Preservation Agency (SHPA). The SHPA shall have 30 calendar days from the date this information is mailed to submit written comments to the local government. If the local government's determination contradicts comments from the SHPA, the local government shall justify how it reached an opposing conclusion. The local government shall revoke the land use approval if the owner has failed to implement the actions described in the "Protection and Enhancement Plan" according to the schedule for completing such actions in this plan. The local government may, however, allow such a use to continue for up to one additional year from the date a local government determines the applicant has failed to implement the actions if the applicant submits a written statement describing unforeseen circumstances that prevented the applicants from completing the specified actions according to the approved schedule, what progress the applicants have made towards completing such actions, and a proposed revised schedule for completing such actions.

10. In the event a court enters a judgment that one or more of the use authorizations provided for in paragraphs one through four of this section are invalid, the authorizations for other uses in this section are severed and will remain in effect.

Additional Resource Protection Guidelines for Uses in Historic Buildings

1. The following guidelines apply to proposed uses listed under "Special Uses for Historic Buildings" in addition to all other relevant guidelines for protection of scenic, cultural, natural and recreation resources:

A. *Cultural Resources*

(1) All applications for uses listed in Guideline 4 of "Additional Review Uses for Historic Buildings" shall include a historic survey and evaluation of eligibility

for the National Register of Historic Places, to be prepared by a qualified professional hired by the applicant. The evaluation of eligibility shall not be required for buildings previously determined to be eligible. For such properties, documentation of a prior eligibility determination shall be included in the application. The historic survey shall meet the requirements specified in "Historic Surveys and Reports" [Management Plan, page I-58]. The evaluation of eligibility shall follow the process and include all information specified in the National Register Bulletin "How to Apply the National Register Criteria for Evaluation" [National Park Service, National Register Bulletin #15].

Eligibility determinations shall be made by the local government, based on input from the state historic preservation Agency (SHPA). The local government shall submit a copy of any historic survey and evaluation of eligibility to the SHPA. The SHPA shall have 30 calendar days from the date this information is mailed to submit written comments on the eligibility of the property to the local government. If the local government's determination contradicts comments from the SHPA, the local government shall justify how it reached an opposing conclusion.

(2) Applications for Special Uses for Historic Buildings shall include a "Protection and Enhancement Plan" which shall include the following:

(a) A description of how the proposed use will significantly contribute to the protection and enhancement of the historic resource, including specific actions that will be taken towards restoration, protection and enhancement, and adequate maintenance of the historic resource, and a proposed schedule for completion of such actions.

(b) A statement addressing consistency of the proposed use with the *Secretary of the Interior's Standards for Rehabilitation of Historic Properties* and the *Secretary of the Interior's Standards for Preservation of Historic Properties*.

(c) Detailed architectural drawings and building plans that clearly illustrate all proposed exterior alterations to the building associated with the proposed use. Any exterior additions to the building or outdoor components of the proposed use (e.g. parking areas, site for temporary structures, interpretive displays) shall be shown on the site plan.

(d) Any proposal for commercial events at a historic property shall include an Operation Plan for Commercial Events, to be incorporated into the "Protection and Enhancement Plan". The Operational Plan shall include sufficient information to demonstrate how the commercial events will remain incidental and subordinate to the primary use of the property, and shall, at minimum, address:

(i) Number of events to be held annually.

(ii) Maximum size of events, including number of guests and vehicles at proposed parking area.

(iii) Provision for temporary structures, including location and type of structures anticipated.

(iv) How the proposed commercial events will contribute to protection and enhancement of the historic resource.

(3) The local government shall submit a copy of the "Protection and Enhancement Plan" to the State Historic Preservation Agency (SHPA). The SHPA shall have 30 calendar days from the date this information is mailed to submit written comments to the local governments. The SHPA comments shall address consistency of the proposed use with the *Secretary of the Interior's Standards for Rehabilitation of Historic Properties* and the *Secretary of the Interior's Standards for Preservation of Historic Properties*, and the effect of the proposed use on the historic resource.

(4) Any alterations to the building or surrounding area associated with the proposed use have been determined by the local government to be consistent with the *Secretary of the Interior's Standards for Rehabilitation of Historic Properties* and the *Secretary of the Interior's Standards for Preservation of Historic Properties*. If the local government's final decision contradicts the comments submitted by the State Historic Preservation Agency, the local government shall justify how it reached an opposing conclusion.

(5) The proposed use has been determined by the local government to have no effect or no adverse effect on the historic character of the property, including features of the property contributing to its historic significance. If the local government's final decision contradicts the comments submitted by the State Historic Preservation Agency, the local government shall justify how it reached an opposing conclusion.

B. *Scenic Resources*

(1) New parking areas associated with the proposed use shall be located on the subject property as it existed as of January 1, 2006. Such parking areas may be developed using paving blocks, gravel, or other pervious surfaces; asphalt, concrete and other impervious materials shall be prohibited.

(2) New parking areas associated with the proposed use shall be visually subordinate from Key Viewing Areas, and shall to the maximum extent practicable, use existing topography and existing vegetation to achieve visual subordinance. New screening vegetation may be used if existing topography

and vegetation are insufficient to help make the parking area visually subordinate from Key Viewing Areas, if such vegetation would not adversely affect the historic character of the building's setting.

(3) Temporary structures associated with a commercial event (e.g. tents, canopies, portable restrooms) shall be placed on the subject property no sooner than two days before the event and removed within two days after the event. Alternatively, temporary structures may remain in place for up to 90 days after the event if the local government determines that they will be visually subordinate from Key Viewing Areas.

C. *Recreation Resources*

(1) The proposed use shall not detract from the use and enjoyment of existing recreation resources on nearby lands.

D. Agricultural and Forest Lands

(1) The proposed use is compatible with and will not interfere with accepted forest or agricultural practices on nearby lands devoted to such uses.

(2) The proposed use will be sited to minimize the loss of land suitable for production of crops, livestock or forest products.

(3) A declaration has been signed by the landowner and recorded into county deeds and records specifying that the owners, successors, heirs and assigns of the subject property are aware that adjacent and nearby operators are entitled to carry on accepted agriculture or forest practices on lands designated Large-Scale or Small-Scale Agriculture, Agriculture-Special, Commercial Forest Land, or Large or Small Woodland.

(4) All owners of land in areas designated Large-Scale or Small-Scale Agriculture, Agriculture-Special, Commercial Forest Land, or Large or Small Woodland that are within 500 feet of the perimeter of the subject property on which the use is proposed to be located have been notified and given at least 10 days to comment prior to a decision on an application for a Special Use for a Historic Building.

CHAPTER

1

Recreation Development Plan

The Recreation Development Plan provides the policy framework for implementing high-priority proposed public recreation facilities. The GMA and Urban Areas section outlines the process for identifying priority recreation projects and the criteria by which projects applicants seeking Scenic Area grants should be evaluated.

In the SMA section, the Recreation Development Plan provides goals and policies for evaluating whether proposals achieve the recreation goals and objectives of the Scenic Area Act.

The proposed recreation facilities are described in the Recreation Development Proposals list, adopted separately from the Management Plan.

The proposals list highlights selected sites and proposed projects at those sites that, when implemented, will best achieve the recreation goals and objectives of the Scenic Area Act.

Section 16 of the Scenic Area Act authorized $10 million for the construction of recreation facilities plus $2.8 million specifically to restore and reconstruct abandoned segments of the Historic Columbia River Highway. It is strongly recommended that the sites described in the Recreation Development Proposals list be given priority consideration for receipt of the public funds authorized by the Act, as well as consideration from other public sources in federal, state, or local programs.

GMA AND URBAN AREA PROVISIONS

GMA and Urban Area Goal

Identify those highest priority recreation projects that best meet the recreation goals and objectives of the Management Plan and facilitate their implementation through the Recreation Development Plan.

GMA and Urban Area Policies

1. Projects identified in the Recreation Development Proposals list are high priorities for public funding and shall receive preferential consideration for receipt of public

monies as authorized in Section 16(b) of the Scenic Area Act and other funds, such as federal, state and local agency grants; foundation grants; and other sources.

2. Disbursement of monies authorized in Section 16(b) of the Scenic Area Act for the GMA shall be limited to projects included in the Recreation Development Proposals list for the GMA and Urban Areas.

3. The Gorge Commission shall maintain and update the "Inventory of Potential Recreation Sites" and the "Inventory of Potential Trails and Travelways" as the need to do so arises. Updating may include adding new proposals to the inventories. These inventories are referred to in the remaining policies of this chapter as "the potential recreation inventories."

4. The Gorge Commission and USDA Forest Service shall prepare and maintain a Recreation Development Plan and Recreation Development Proposals List. The Gorge Commission shall review and update the Recreation Development Plan and Recreation Development Proposals List periodically. Recreation Development proposals should be evaluated against applicable Management Plan policies for the protection of natural, cultural, and scenic resources and avoidance of effects on Indian treaty rights.

5. The Gorge Commission shall evaluate proposed recreation facilities at sites in Urban Areas, in consultation with port districts, city and county park agencies, Indian tribal governments, and other appropriate groups, and add appropriate sites to the potential recreation inventories. Such sites may be included in future additions to the Recreation Development Proposals list.

6. Urban Area projects included in the Recreation Development Proposals list shall comply with GMA Management Plan policies regarding the following:

   A. Indian treaty rights.

   B. Wetlands, aquatic and riparian areas.

   C. Sensitive wildlife habitat.

   D. Sensitive plants.

   E. Cultural resources.

7. Urban Area projects included in the Recreation Development Proposals list shall be designed in a manner that is compatible with, and where practicable, enhances the visual quality of their setting. These projects should include design features such as generous plantings of native and naturalized riparian vegetation, screening of parking areas, minimizing large areas of parking lots, minimizing

grading, providing public green spaces, etc. Projects that rehabilitate and improve the aesthetic quality of previously disturbed areas will be given preferential consideration for receipt of funds.

8. The Gorge Commission shall submit to Congress and the Secretary of Agriculture a list of projects recommended for receipt of recreation grant monies as authorized under Section 16(b) of the Scenic Area Act.

9. Those projects prioritized for further study, as specified in the Recreation Development Proposals list, may be considered eligible for facility construction funds pending the completion and results of such studies.

10. Funds allocated per Section 16(b) of the Scenic Area Act for a site included in the Recreation Development Proposals list shall be made available only to those proposed projects consistent with the recommendations for that site in the Recreation Development Proposals list.

11. Preferential consideration for funding allocated per Section 16(b) of the Scenic Area Act shall be given to projects demonstrating the following characteristics:

    A. Provision of substantial barrier-free opportunities.

    B. Provision of accommodation for alternative or mass transportation.

    C. Favorable investment/user ratio.

    D. Agency partnerships.

    E. Strong public support.

    F. Enhancement of scenic, natural, and/or cultural resources.

12. The Gorge Commission shall periodically monitor implementation of projects wholly or partially funded pursuant to Section 16(b) of the Scenic Area Act to evaluate their compliance with Policy 11, above.

GMA and Urban Area Recreation Development Plan Grant Guidelines

1. To be eligible for receipt of Scenic Area recreation grants, project applicants shall submit an application packet to the Gorge Commission. Information submitted shall include the following:

    A. A formal request by a public agency that either owns the site upon which a proposal is located or manages that site. In the latter case, documentation of landowner consent for the proposal shall be included.

B. A preliminary facility plan, showing the type, location and design features of all proposed development. (The plan may be conceptual.) This plan should indicate the location of any buildings, roads, parking areas, landscaping, irrigation, water storage, and/or other fire suppression features; grading work; and other site improvements associated with the proposal.

C. A narrative report (may include supporting maps or other graphics) addressing the presence of the following resources on the site and the proposed project's potential effects (and appropriate mitigation measures, if applicable) on those resources:

   (1) Archaeological, historic or other cultural resources.

   (2) Wetlands, aquatic, and riparian areas; sensitive wildlife habitat; sensitive plants.

D. A discussion of tribal treaty fishing activities (or other tribal activities protected by treaties) in the project vicinity and the proposed project's potential effects on those activities (and, if applicable, mitigation measures to avoid effects to such activities).

E. An itemized request for a specified amount of money for construction of those facilities described in the preliminary facility site plan. (Costs of mitigation measures that are required as part of facility development may be included in funding requests.)

F. A discussion of how the project complies with the six criteria listed in Policy 11, above.

SMA PROVISIONS

SMA Goal 1

Provide opportunities for public and private recreation use and access to the Columbia River.

SMA Policies

1. Increased access to the Columbia River should be provided.

2. Water-oriented day-use recreation access is emphasized along the Columbia River. Additional campgrounds should be located in proximity to these popular day-use attractions.

3. Opportunities for private recreation resource enhancement should be provided through partnership with public agencies and through application of the recreation intensity class guidelines (Part I, Chapter 4).

SMA Goal 2

Provide a diversity of trail opportunities in the National Scenic Area.

SMA Policies

1. Trails should be provided to link Urban Areas and recreation opportunities in the Scenic Area.

2. A loop trail through the Scenic Area should be supported.

3. Equestrian and mountain bike use should be limited to areas where natural resource sensitivities are low.

4. Trail systems and new trails should incorporate existing segments of older, abandoned, or historic trails.

5. New trails should be provided along the Columbia River shoreline.

6. Trail linkages should be provided between Scenic Area trails and trails on other public lands outside the Scenic Area.

7. Safe bikeways should be provided for recreation use on appropriate public roads.

SMA Goal 3

Increase public awareness, understanding, and appreciation of the scenic, natural, cultural, economic, and recreational resources of the Scenic Area.

SMA Policies

1. Policies for interpretation and education are found in Part III, Chapter 4: Interpretation and Education.
2. New scenic viewpoints should be provided to showcase the grand panoramas of the Scenic Area.

SMA Goal 4

Provide for the restoration and connection of the remaining segments of the Historic Columbia River Highway in keeping with its National Register status.

SMA Policies

1. The corridor of the Historic Columbia River Highway should be managed in cooperation with the State of Oregon as an historic visitor attraction.
2. Intact and usable highway segments should be connected with recreation trails to create a continuous route through the Columbia River Gorge that links local, state, and federal recreation and historic sites.
3. The recommendations identified in *A Study of the Historic Columbia River Highway* (1987) should be followed for restoration and connection projects.

SMA Goal 5

Maximize customer service and cost-effectiveness of recreation opportunities by using partnerships of user groups and recreation providers to design and construct recreation facilities.

SMA Policies

1. Partnerships between private entities, agencies, and/or organizations are the preferred approach for developing recreation facilities.
2. Recreation development shall be coordinated with present and proposed recreation activities of local and state land use plans or outdoor recreation plans, particularly the state Comprehensive Outdoor Recreation Plan.
3. Cooperative planning with appropriate agencies and tribal governments should be encouraged where proposed in-lieu Indian fishing sites may provide multiple benefits.

CHAPTER

2

Economic Development

The Columbia River Gorge is home to nearly 55,000 people. Congress intended the Scenic Area Act to support the economy of their communities in the Scenic Area. The second of the Act's two stated purposes is to protect and support the economy of the Gorge by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with protection of scenic, cultural, recreation, and natural resources [Section 3(2)].

The goals and policies in this chapter support the Gorge's principal economic sectors, such as agriculture, forestry, and tourism, while allowing new commercial uses on lands designated Rural Center, Commercial, and Commercial Recreation.

GMA PROVISIONS

GMA Goals

1. Protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing Urban Areas.

2. Protect and support the economy of the Columbia River Gorge area by allowing future economic development in a manner that is consistent with the protection and enhancement of the scenic, cultural, recreation, and natural resources of the Columbia River Gorge.

GMA Policies

1. The Gorge Commission shall consult with the States of Washington and Oregon in the development and implementation of their economic development plans.

2. The Gorge Commission shall support the economic development efforts of the States of Oregon and Washington pursuant to their economic development plans established under the Scenic Area Act.

3. The Gorge Commission shall encourage the States of Washington and Oregon to coordinate their economic development planning in order to maximize the benefits of federal dollars to all Gorge communities.

4. Agriculture and forest industries in the Columbia River Gorge shall be protected and supported by preventing fragmentation of the land base and by minimizing interference with agricultural and forest practices from conflicting uses.

5. The economic vitality of the Gorge economy shall be enhanced by encouraging growth to occur in Urban Areas.

6. New commercial uses shall be allowed outside Urban Areas on lands designated:

   A. Rural Center.

   B. Commercial.

   C. Commercial Recreation.

7. The following commercial uses may be allowed outside Urban Areas:

   A. Home occupations and cottage industries in all designations except Open Space.

   B. Commercial recreation in appropriate recreation intensity classes throughout the Scenic Area.

   C. Commercial uses in conjunction with public recreation on lands designated Public Recreation.

   D. Conversion of existing industrial sites to commercial use.

   E. Wineries and farm produce stands on lands designated Large-Scale or Small-Scale Agriculture, Commercial Forest Land, or Large or Small Woodland.

   F. Commercial events in all GMA designations except Open Space and Agriculture Special, in conjunction with a lawful winery, wine sales/tasting room, bed and breakfast inn, commercial use or dwelling listed in the National Register of Historic Places.

   G. Commercial uses in all GMA designations except Open Space and Agriculture Special on a property with a building either on or eligible for the National Register of Historic Places, and that was 50 years or older as of January 1, 2006.

8. The Gorge Commission shall support the economy of Gorge communities by encouraging recreation development at appropriate rural locations.

9. The Gorge Commission shall recognize the special role of the five ports in the Scenic Area as providers of river transportation and recreation facilities in Urban Areas, and support their efforts to stimulate urban waterfront economic development by:

   - Assigning priority for revisions to Urban Area boundaries to those requests involving port properties or projects.

   - Relying upon existing state and federal wetlands regulations on the Columbia River and exempting urban waterfronts from wetland and riparian area guidelines in the Management Plan.

10. Prior to the approval of any grant under the states' plans for economic development projects pursuant to Section 11 of the Scenic Area Act, the Gorge Commission shall certify that all activities undertaken under the grant are consistent with the purposes of the Scenic Area Act, the Management Plan, and land use ordinances adopted pursuant to the Scenic Area Act.

    If such activities would take place wholly within an Urban Area, the Gorge Commission shall, after consultation with the appropriate city or county, certify that the activities are consistent with the Scenic Area Act, the Management Plan, and land use ordinances.

11. In consultation with the States of Washington and Oregon and Gorge counties, and after public hearings, the Gorge Commission established a process for certifying that activities to be undertaken under a grant pursuant to Section 11 of the Scenic Area Act are consistent with the purposes of the Scenic Area Act, the Management Plan, and land use ordinances adopted pursuant to the Scenic Area Act. The Gorge Commission shall maintain this certification process so that it is simple, efficient, and speedy to not delay consistent activities. The details of economic development projects shall be confidential consistent with Gorge Commission rules on disclosure of public records.

CHAPTER

3

Enhancement Strategies

The first purpose of the Scenic Area Act is "to establish a national scenic area to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge" [Section 3(1)]. *Webster's New Collegiate Dictionary* (C. and G. Merriam Co. 1977) defines "enhance" in the following ways: 1) to raise, and 2) to make greater (as in value, desirability, or attractiveness.)

This chapter includes the Management Plan's specific objectives for enhancement of the resources of the Columbia River Gorge. The subjects covered include scenic, cultural, recreational, and natural resources, as well as forest and agricultural lands and emergency services. Some of these objectives are also referenced in the specific chapters on a particular resource or land use designation. For the most part, the enhancement strategies represent non-regulatory approaches to achieve enhancement objectives. These strategies include landowner incentives, technical assistance, educational programs, and voluntary intergovernmental agreements.

OVERALL GMA AND SMA ENHANCEMENT STRATEGIES

GMA/SMA Objectives

1. Encourage the establishment of a public or private conservancy to acquire or otherwise protect those lands within the GMA for which the Management Plan cannot offer adequate protection without denying a reasonable economic use. Seek funds to enhance the conservancy capability in the Scenic Area. Seek acquisition priority for tracts of private land designated Open Space; for other lands with sensitive scenic, cultural, or natural resources; and for lands whose owners are confronted with unusual hardship resulting from application of policies or guidelines in the Management Plan.

2. In consultation with state and federal agencies, the counties, and the Indian tribes, develop handbooks for landowners to inform them of opportunities to protect and enhance natural and scenic resources on their lands, including assistance programs offered by state and federal agencies.

3. Establish a Vegetation Advisory Committee to advise the Gorge Commission, the Forest Service, the Washington and Oregon Departments of Transportation, and county road departments on improvement of vegetation management techniques to protect scenic, cultural, and natural resources.

SCENIC RESOURCES ENHANCEMENT STRATEGIES

GMA/SMA Objectives

1. Screen or improve the appearance of discordant features in the landscape.

   A. In conjunction with local governments, develop an inventory of discordant features in the Gorge landscape.

   B. Establish a program of incentives to bring existing structures into compliance with guidelines for scenic resources, prioritizing discordant features in the foreground of scenic travel corridors.

      (1) Rehabilitate roadcuts and other disturbed areas in the landscape.

      (2) Encourage removal of abandoned structures.

      (3) Encourage removal or replacement of signs that do not conform to the sign guidelines for the GMA (Part I, Chapter 1: Scenic Resources) and the SMA (Part II, Chapter 7: General Policies and Guidelines).

      (4) Work with local governments to offer technical assistance and design suggestions to private developers.

      (5) Provide incentives to convert existing industrial complexes to uses more consistent with the purposes of the Scenic Area Act and land use designation. *(Added: CRGC adopted 7/7/08; U.S. Sec. Ag. concurrence 10/8/08)*

   C. Establish coordinated, cooperative programs with the Oregon and Washington Departments of Transportation, the Bonneville Power Administration, utilities, and the railroads to reduce the visual effect of existing facilities. The programs should:

(1) Encourage the railroads and utilities to place signal wires and powerlines underground where they are visually dominant and detract from the visual quality of the landscape.

(2) Encourage the use of visually subordinate colors on existing equipment.

(3) Encourage improvement of existing rights-of-way by restoring vegetation to its natural appearance.

(4) Encourage the use of integrated practices in managing vegetation in the foreground of scenic travel corridors.

D. Undertake the following activities in the SMA:

(1) Revegetate clearcuts and disturbed areas with native vegetation wherever appropriate.

(2) In the Gorge Walls, Canyons, and Wildlands setting, obliterate and revegetate unused and closed roads and remove non-historic structures or other developed features.

(3) Acquire scenic easements, where necessary, to reduce development pressures and maintain uses that exemplify the landscape setting.

2. Improve the visual and recreational quality of the scenic travel corridors by implementing the recommendations in the Corridors Visual Inventory (April 1990) and the highway corridor strategies for Washington State Route 14, Interstate 84, the Historic Columbia River Highway.

A. Develop a memorandum of understanding with the Oregon and Washington Departments of Transportation to carry out the recommendations in the Corridors Visual Inventory.

B. Encourage the Oregon and Washington Departments of Transportation to take the following measures to improve the visual quality of scenic travel corridors:

(1) Place reflectors on guardrails rather than on free-standing posts.

(2) Remove unnecessary highway signs; consolidate necessary signs where possible.

(3) Replace sections of white guardrail where white contrasts noticeably with gray or galvanized sections.

(4) Eliminate unnecessary construction berms.

(5) Close unused road accesses from scenic travel corridors.

(6) Eliminate maintenance stockpile sites that are visible from scenic travel corridors.

(7) Create or restore openings in vegetation along Washington State Route 14, Interstate 84, and the Historic Columbia River Highway to provide or improve views of the Columbia River and the walls of the Gorge in a manner that does not adversely affect scenic, cultural, natural, or recreation resources of the Scenic Area.

C. Encourage communities along scenic travel corridors to enhance the entries to their communities.

D. Provide Forest Service cost-share funding, including recreation funds, in order to encourage the placement of Scenic Area entry signs consistent with the Columbia River Gorge National Scenic Area Graphic Signing System.

3. Encourage federal and state agencies to monitor air quality and visibility in the Scenic Area, and utilize the results of such monitoring in developing and updating the regional air quality protection and enhancement strategy described in SMA Natural Resources Wildlife and Plants Policy 15 (Part I, Chapter 3: Natural Resources).

4. Encourage timber operators in the GMA to protect scenic values in scenic travel corridors, using the following measures:

A. Ask project applicants to seek technical assistance to protect scenic values.

B. Encourage the Forest Service or other appropriate resources to provide technical assistance to project applicants and/or local government.

C. Encourage project applicants to design appropriate clearcut size, location, and pattern.

D. Encourage use of conservation easements to mitigate project impacts and recognize property values.

CULTURAL RESOURCES ENHANCEMENT STRATEGIES

GMA/SMA Objectives

1. Increase understanding of and appreciation for cultural resources.

A. Promote educational and interpretive programs that increase public awareness of cultural resources.

B. Develop cooperative programs with Native Americans to enhance public understanding of their cultural history.

C. Increase public awareness of historic structures and sites and of the National Register of Historic Places.

D. Encourage increased efforts to research and document the cultural history of the area through ongoing oral history projects, including interviews of "oldtimers" and Native Americans.

2. Promote the protection, restoration, and enhancement of cultural sites.

A. Seek funds for a complete cultural resource inventory of the Scenic Area, in coordination with Indian tribal and local governments and state and federal agencies.

B. Determine an appropriate strategy for protection of sensitive cultural resource sites such as Miller Island.

C. Identify and map traditional plant-gathering areas and restore the plant habitat wherever possible.

D. Identify and interpret Oregon trail locations throughout the Scenic Area.

E. Develop a comprehensive strategy for the entire Scenic Area to integrate all law enforcement efforts for purposes of cultural resources protection.

F. Expand education programs to gain public support for vandalism prevention.

3. Encourage enhancement of historic and landmark structures and cultural landscapes.

A. Promote public awareness of tax and other incentives available for the protection of historic buildings.

B. Promote retention or rehabilitation of historic rock guardrails and other historical components of the highway rights-of-way wherever practicable.

C. Ensure that restoration projects are in keeping with National Register status of structures, facilities, or landscapes.

D. Encourage local governments to expand existing incentives for the protection of historic buildings, including adopting resolutions or ordinances that facilitate landowner access to federal and state programs providing such incentives.

NATURAL RESOURCES ENHANCEMENT STRATEGIES

GMA/SMA Objectives

1. Enhance soil, water, and air resources to ensure sustainability of natural resources over time.

   A. Facilitate implementation of Natural Resources Conservation Service and land-grant university cooperative extension programs to increase soil productivity.

   B. Develop a program to enhance soil water retention and reduce runoff. Give preference to use of native species.

   C. Encourage federal and state agencies to undertake a comprehensive water quality monitoring program on the Columbia River and its major tributaries.

2. Establish cooperative programs to enhance significant natural resources in the Scenic Area. Programs should emphasize public lands, but encourage participation by private landowners.

   A. Develop a comprehensive program to inventory existing oak woodlands and propose methods for their protection, including incentives for property owner cooperation and support, acquisition of sensitive stands, and easements to preserve the oaks on large parcels.

   B. Work cooperatively with private owners, native plant societies, concerned individuals, and other organizations to enhance floral habitats. Expand the inventories of wildflower areas throughout the Scenic Area; develop protection guidelines and strategies, such as easements, acquisition, and mitigations; and encourage nurseries to carry native species for landscaping or mitigation proposals.

   C. Support the Northwest Power Planning Council's efforts to restore anadromous fish runs in the Columbia River. Participate in these efforts by implementing the Forest Service three-region fish policy for coordinated management of anadromous fish resources.

   D. Work cooperatively with the state wildlife agencies and landowners to enhance conservation of winter range and to identify and develop strategies

(including tax incentives) for non-game wildlife habitat conservation and enhancement.

E. Continue and expand programs to enhance waterfowl habitat and shallow-water fish habitat.

F. Provide Forest Service evaluation of identified natural areas for possible designation as a Research Natural Area (RNA). Where appropriate, prepare reports and recommendations for designation as RNA.

G. In cooperation with state and federal agencies, design and implement a restoration and enhancement program for wetlands and riparian areas, to include revegetation and stream channel improvements for wildlife and fish habitats.

H. Encourage the use of fire to restore and perpetuate natural ecosystems.

3. Develop educational and technical assistance programs to expand public awareness and understanding of ecological principles and ecosystem management.

A. Develop public education opportunities that will foster better appreciation and understanding of the natural resources and land stewardship. These opportunities should be closely linked to the Columbia River Gorge National Scenic Area Interpretive Strategy.

B. Develop an interagency education program to foster protection of wetlands and riparian areas from cattle grazing.

C. In cooperation with the appropriate state and federal agencies (e.g., State Extension Service), develop supporting documentation and provide technical assistance for landowners exploring alternatives to chemical use for vegetation management.

RECREATION RESOURCES ENHANCEMENT STRATEGIES

GMA/SMA Objectives

1. Enhance the recreational experience in the Scenic Area.

A. Encourage the creation or restoration of openings in vegetation along Washington State Route 14, Interstate 84, and the Historic Columbia River Highway to provide or improve views of the Columbia River and the walls of the Gorge.

B. Promote programs that increase awareness and appreciation of the great diversity of natural, cultural, scenic, and recreation resources of the Scenic Area.

C. Encourage provision of alternative modes of transportation (including bus, shuttles, rail, and boat) to recreation destinations in order to reduce resource impacts and to facilitate visitation by all segments of the public.

D. Encourage provision of transportation modes that are recreational in nature.

E. Improve linkages between different modes of transportation at major recreation sites in the Scenic Area.

F. Encourage comprehensive recreation planning that fosters a unified, regional approach.

G. Provide additional opportunities and facilities for recreational access to the Columbia River and its tributaries, scenic appreciation, and other resource-based recreation uses.

FOREST LAND ENHANCEMENT STRATEGIES

SMA/GMA Objectives

1. Enhance the ability of forest land to ensure continued productivity and economic benefits over time.

   A. Enhance forestry on lands designated Commercial Forest Land or Large or Small Woodland by encouraging consolidation of small, inefficient tracts into more efficient ownerships.

   B. Enhance forestry by encouraging Washington and Oregon to consider grants and loans to secondary processors of forest products under Section 11 of the Scenic Area Act and other economic development programs.

   C. Undertake the following actions by the Forest Service:

      (1) Develop cooperative programs with state agencies, educational groups, and concerned individuals to encourage the protection and integration of soils, forest ecosystems, long-term productivity, and natural resources.

      (2) Initiate forest management projects to demonstrate good stewardship and long-term sustainable forest management

(3) Provide technical assistance to forest managers for design of forest management activities to ensure sustained productivity.

(4) Increase public awareness of existing programs designed to ensure sustained productivity, such as the forestry incentive program and the use of easements.

(5) Develop incentive programs to encourage long-term stewardship for small woodlot management.

(6) Assist with marketing and research efforts to enhance the economic viability of secondary manufacturing for wood products, increased utilization of wood products and other miscellaneous forest products.

AGRICULTURAL LAND ENHANCEMENT STRATEGIES

GMA/SMA Objectives

1. Enhance the sustainability of agricultural land to ensure continued economic benefits.

   A. Encourage consolidation of small, inefficient parcels of agricultural land into larger, more efficient tracts.

   B. Support and promote the Oregon and Washington farm value assessment programs that provide tax incentives for continued agricultural use and enhance the competitive capabilities of farms and ranches, thereby encouraging the long-term enhancement, preservation, and expansion of agricultural lands. Support programs that encourage agricultural practices that preserve other natural resources.

   C. Develop new strategies to provide incentives for soil and water conservation and for sustained agricultural productivity.

   D. Promote public education programs that foster greater understanding of agricultural practices, agricultural ecosystems, and good stewardship of the land.

   E. Encourage cooperative programs with state and federal agencies and the Soil Conservation Service to explore the integration of wildlife needs with agricultural practices. Such practices could include retention of hedge rows, construction of windrows, management of small commercial woodlands, restoration of native grasses, restoration of wetlands, and integrated pest management.

F. Encourage the protection of non-commercial woodlands, such as oak stands, for groundwater replenishment, soil retention, and wildlife habitat needs.

G. Enhance agriculture by allowing processing and packing of agricultural products and other uses that offer direct marketing opportunities, subject to review to minimize the loss of agricultural land and to limit the size and scale of use.

EMERGENCY SERVICES STRATEGIES

GMA/SMA Objectives

1. With facilitation by the Forest Service, develop a coordinated, interagency emergency response plan for the Scenic Area. The plan should address law enforcement; search and rescue services; and fire, hazardous materials, and catastrophic event response services. The plan should include the following elements:

   A. A coordinated incident command system developed by the agencies and communities in the Gorge, including federal, state, county, city, and protection district agencies.

   B. A Forest Service interagency fire management strategy, including an assessment of fire potential.

   C. Consultation with a Forest Service resource advisor during emergency situations, including fire suppression, law enforcement, search and rescue, hazardous materials, and other catastrophic incidents, in order to avoid adversely affecting scenic, cultural, recreation, and natural resources.

   D. Increased law enforcement services on National Forest lands by the Forest Service and by interagency agreements.

CHAPTER

4

Interpretation and Education

Interpretive and educational programs and facilities are an important part of Congress's vision for the Scenic Area, as well as the vision of the Gorge Commission and Forest Service, expressed through the provisions of the Management Plan. Sections 6 and 8 of the Scenic Area Act specifically direct both agencies to "identify areas suitable for. . . public use facilities. . . including. . . educational and interpretive facilities."

This chapter provides a basic policy framework guiding the interpretative and educational programs for the Scenic Area. Specific goals, objectives, and guidelines for interpretation are included in Part I, Chapter 4: Recreation Resources. The *Interpretive Strategy for the Columbia Gorge National Scenic Area*, incorporated by reference into the Management Plan, is a separate document that provides detailed recommendations for interpretive themes, facilities, and programs at particular sites in the Scenic Area. It is recommended that readers interested in specific interpretive and educational opportunities and facilities refer to that document.

GMA/SMA PROVISIONS

GMA/SMA Goal

Protect and enhance the human and natural resources of the Scenic Area by increasing public awareness, understanding, and appreciation of them.

GMA/SMA Policies

1. Interpretive and educational facilities and activities should be provided that increase awareness, understanding, and appreciation of the diversity of Scenic Area resources and their interrelationships.

2. Interpretive and educational facilities and activities should be provided that increase awareness and understanding of how Gorge resources have affected

human activity, and how human activity has affected and continues to affect all the resources of the Gorge.

3. Interpretive and educational opportunities should be provided that attract visitors to the Gorge, meet their needs, enhance their experience, and increase their knowledge.

4. A full spectrum of barrier-free (physical, linguistic, cultural, sensory) interpretive and educational opportunities should be provided.

5. Implementation of interpretive and education facilities and activities in the Scenic Area should follow the recommendations of the Columbia River Gorge National Scenic Area Interpretive Strategy.

6. The Gorge Discovery Center at Crate's Point should be the focus and nucleus of interpretive planning and activities in the Scenic Area. Interpretive staff should coordinate with other agencies and partners.

7. The interpretive program at the Skamania Lodge Conference Center should function as an extension of The Gorge Discovery Center, providing both orientation information and interpretive services.

8. An environmental education program based on the resources of the Gorge should be established for elementary through secondary students and adult groups.

9. Four gateway centers, a series of information stations, and Scenic Area entry signs should be established to provide Gorge-wide visitor orientation information and interpretation based on the immediate environment.

10. All interpretive and educational facilities, activities, and media shall be designed to comply with all the guidelines and policies of the Management Plan.

11. Measures to protect sensitive cultural and natural resources shall be required as part of any interpretive or educational effort. Tribal consultation shall be required for any efforts involving interpretation of Native American prehistory, history, or culture.

12. Interpretive and educational facilities shall be funded through recreation appropriations and partnerships.

CHAPTER

1

Gorge Commission Role

Congress assigned to the Gorge Commission a number of duties to implement the Scenic Area Act. These include ensuring compliance with the Management Plan, revising the Management Plan when needed, changing Urban Area boundaries, and hearing appeals of county decisions. The policies in this chapter define the manner in which these duties will be discharged.

AMENDMENT OF THE MANAGEMENT PLAN

Congress gave the Gorge Commission the authority to amend the Management Plan, after adoption, if it determines that conditions within the Scenic Area have changed significantly.

Policies

1. The Gorge Commission may amend the Management Plan, upon application by any person or upon its own motion, if it determines that conditions within the Scenic Area have changed significantly since adoption of the Management Plan. Plan amendments must be consistent with the Scenic Area Act and other provisions of the plan.

2. The Gorge Commission shall consider a proposal to amend the Management Plan at a hearing held for that purpose only after consultation with the Forest Service, the Indian tribes, and the appropriate county or counties.

3. The Gorge Commission shall consider a plan amendment upon a final judicial determination that a taking of private property has occurred as a result of application of the Management Plan. The judicial determination shall be deemed a significant change in conditions under Section 6(h) of the Scenic Area Act.

4. The Gorge Commission shall submit amendments of the Management Plan to the Secretary of Agriculture in accordance with Section 6(h) of the Scenic Area Act.

REVISION OF THE MANAGEMENT PLAN

Congress directed the Gorge Commission to review the Management Plan at least every 10 years to determine whether it should be revised.

Policies

1. The Gorge Commission shall review the Management Plan in accordance with the Scenic Area Act.

2. As part of its review, the Gorge Commission shall consult the Indian tribes, the states of Oregon and Washington, and the counties during the review to solicit their views on whether the Management Plan should be revised and how it should be revised.

3. As part of its review, the Gorge Commission shall hold one or more public hearings to solicit the views of the public as to whether and how the Management Plan should be revised.

4. The Gorge Commission shall collaborate with the USDA Forest Service to determine whether revisions should be made to the Management Plan.

5. If the Gorge Commission revises the Management Plan during its review, it shall submit the revised Management Plan to the Secretary of Agriculture in accordance with Section 6(g) of the Scenic Area Act.

MONITORING IMPLEMENTATION OF THE MANAGEMENT PLAN

Once the Gorge Commission has adopted the Management Plan and the counties have put ordinances in place to give it effect, Congress and the people of the Gorge and the nation are entitled to know whether the Management Plan is working. The Gorge Commission shares responsibility with the Forest Service to monitor and evaluate the implementation of the Management Plan.

Congress expressly directed the Gorge Commission to monitor implementation of the Management Plan by the counties:

> The Commission shall monitor activities of counties pursuant to this Act and shall take such actions as it determines are necessary to ensure compliance [Section 15(a)(1)].

It is not just the counties, however, that have implementation duties under the Scenic Area Act and the Management Plan. The Forest Service, other federal agencies, state

agencies, local governments, and the Gorge Commission itself all have responsibilities after the Management Plan is adopted. Activities by counties and these agencies will, to a large extent, determine the success or failure of the Scenic Area Act.

The Gorge Commission, in cooperation with the Forest Service, the counties, the Indian tribes, local governments, and state and federal agencies, must establish and carry out a program of monitoring and evaluating the implementation of the Management Plan.

Policies

1. The Gorge Commission shall work with the Forest Service, the counties, the Indian tribes, local governments, and state and federal agencies to establish a program for monitoring and evaluating the implementation of the Management Plan and the Scenic Area Act.

2. The Gorge Commission shall design its monitoring and evaluation program to accomplish the following purposes:

   A. Determine whether the Management Plan is protecting the scenic, cultural, natural, and recreation resources of the Scenic Area.

   B. Determine whether the Management Plan supports and protects the economy of the Columbia River Gorge area.

   C. Determine whether the counties are properly implementing the Management Plan.

   D. Evaluate the Management Plan for possible revisions at the time of periodic review of the Management Plan as required by the Scenic Area Act.

   E. Determine whether the enhancement measures and programs called for in the Management Plan have in fact enhanced the scenic, cultural, natural, and recreation resources of the Scenic Area.

   F. Ensure compliance with orders issued by the Gorge Commission in development reviews and enforcement proceedings.

3. As part of its monitoring and evaluation program, the Gorge Commission shall evaluate county development review decisions. In consultation with the counties, the Gorge Commission shall develop a method to record and evaluate the decisions. The Gorge Commission shall first discuss the results of its evaluation with each county.

4. The Gorge Commission shall monitor land use appeals taken to county elected officials in which the appellant asserts a taking claim based upon a requirement in

the Management Plan. Upon request by a county, the Gorge Commission shall extend appropriate assistance to the county.

5. The Executive Director of the Gorge Commission or her designee may appeal a county land use decision or participate in an appeal of a county land use decision filed by another party. In such an appeal, the Executive Director does not represent the position or stated direction of the Columbia River Gorge Commission. The appeal shall be pursuant to the county's appeal process and the county's final decision may be appealed to the Gorge Commission at the conclusion of the county's appeal process.

6. In cooperation with the Forest Service, the Gorge Commission shall keep current and work to improve the database in the inventories that form the basis of the Management Plan.

7. The Gorge Commission shall work with Gorge counties and the States of Washington and Oregon to identify and reconcile differences in direction to county governments from the Scenic Area Act, the Bi-State Compact, the Management Plan, and other state statutes.

CIVIL PENALTIES

Congress authorized the Gorge Commission to assess a civil penalty in order to prevent violations of the Management Plan, a county ordinance, or any Gorge Commission order or implementation measure.

Policies

1. The Gorge Commission shall adopt rules to implement the requirements of the Scenic Area Act related to enforcement after consultation with the Secretary, the counties, and the Indian tribes and only after public hearings.

APPEALS TO THE GORGE COMMISSION

Congress authorized persons and entities to appeal decisions relating to the implementation of the Scenic Area Act.

Policies

1. The Gorge Commission shall adopt rules to implement the appeals provisions in the Scenic Area Act after consultation with the Secretary, the counties, and the Indian tribes and only after public hearings.

2. The Gorge Commission shall hear appeals of final enforcement actions relating to implementation of the Management Plan.

REVISION OF URBAN AREA BOUNDARIES

Congress designated 13 cities and towns as "Urban Areas": Cascade Locks, Hood River, Mosier, and The Dalles, Oregon; and Bingen, Carson, Dallesport, Home Valley, Lyle, North Bonneville, Stevenson, White Salmon, and Wishram, Washington. Urban Areas are exempt from regulation under the Management Plan. Congress established the boundaries of the Urban Areas when it enacted the Scenic Area Act. However, it authorized the Gorge Commission to make minor revisions to the Urban Area boundaries. Congress also set forth in the Scenic Area Act a process and criteria for use by the Gorge Commission in carrying out the revision process. The following policies govern the revision of Urban Area boundaries.

Policies

1. The Commission shall adopt rules that implement the requirements of the Scenic Area Act related to the revisions of Urban Area boundaries.

2. The Gorge Commission may make minor revisions to the boundaries of Urban Areas upon a majority vote of two-thirds of the members of the Gorge Commission, including a majority of the members from each state.

3. A county may apply to the Gorge Commission to make a minor revision in the boundary of an Urban Area within the county's jurisdiction.

4. Before revising an Urban Area boundary, the Gorge Commission shall consult with the Secretary of Agriculture prior to any hearing on the revision.

5. The Gorge Commission shall consider an application for a minor revision to an Urban Area boundary at a hearing held for that purpose. The Gorge Commission shall adopt procedures for urban boundary revision hearings.

6. The Gorge Commission shall review and consider proposed revisions to Urban Area boundaries that do not qualify for revision under Section 4(f) of the Scenic Area Act. After review, and after a public hearing on the matter, the Gorge Commission shall consider appropriate recommendations to Congress on the boundaries. The Gorge Commission shall attempt to complete these reviews within 5 months after adoption of the Management Plan.

Guidelines

1. The Commission may revise the boundaries of an Urban Area only if it finds that all of the following conditions exist and that the proposal is consistent with Commission rules related to revisions of Urban Area boundaries:

    A. A demonstrable need exists to accommodate long-range urban population growth requirements or economic needs consistent with the Management Plan.

    B. Revision of Urban Area boundaries would be consistent with the purposes of the Scenic Area Act and the standards established in Section 6 of the Act.

    C. Revision of Urban Area boundaries would result in maximum efficiency of land uses within and on the fringe of existing Urban Areas.

    D. Revision of Urban Area boundaries would not result in the significant reduction of agricultural lands, forest lands, or open spaces.

REVISION OF SCENIC AREA BOUNDARIES

The Scenic Area Act does not contain administrative procedures or substantive criteria for revising the exterior boundaries of the Scenic Area. Congressional action will be required before lands can be added to or removed from the Scenic Area.

The Gorge Commission recognizes that circumstances may exist or arise that necessitate a change in the boundaries of the Scenic Area. The Gorge Commission will consider proposed boundary revisions on a case-by-case basis. Recommendations for revising the boundaries of the Scenic Area will be forwarded to Congress.

Policy

1. The Gorge Commission shall review and consider proposed revisions to the boundary of the Scenic Area for appropriate recommendations to Congress. The Gorge Commission shall consider first any proposed revision involving land within an urban service boundary established prior to enactment of the Scenic Area Act.

COUNTY ORDINANCES

Policies

1. Counties may adopt ordinances with provisions that vary from the policies and guidelines in the Management Plan as long as the ordinances provide greater

protection for the scenic, cultural, natural, and recreation resources of the Scenic Area. Notwithstanding the designation policies in Part II of the Management Plan, the Gorge Commission shall, upon request from a local government, apply a more restrictive designation.

2. A county and a city may enter into an agreement to allow the other to implement a land use ordinance that applies to the city and that has been approved or adopted by the Gorge Commission under Section 8 of the Scenic Area Act.

3. Counties may grant variances to provisions in their land use ordinances that are not required by a policy or guideline in the Management Plan.

4. The Gorge Commission shall encourage the States of Washington and Oregon to make funds available to the counties to assist in the implementation of the Scenic Area Act and the Management Plan.

5. The Gorge Commission shall seek funds and an interagency agreement with the Forest Service to provide the services of resource professionals, such as biologists and archaeologists, to assist local governments and landowners to carry out the policies and guidelines in the Management Plan.

PUBLIC INVOLVEMENT

The Gorge Commission believes that timely and appropriate public involvement is key to the long-range success of the Scenic Area Act.

The purpose of the goals and policies in this chapter is to ensure a formal ongoing public involvement program.

GMA Goals

1. Provide for and consider a variety of viewpoints in decision making.

2. Encourage an informed public.

3. Consult and coordinate with other governmental jurisdictions, including the Forest Service, Indian tribal governments, county boards, city councils, and other state and federal agencies.

GMA Policies

1. A time for public comment shall be provided at all regular Gorge Commission business meetings. Meetings shall be rotated among suitable meeting spaces to make it convenient for residents of different areas to attend.

2. Notice of Gorge Commission meetings shall be distributed to all interested people and the media, without charge. Notices shall describe, in plain language, the topics the Gorge Commission will discuss and which topics are open for public comment. Notices shall also be provided to county planning offices and public libraries for posting for public review.

3. Informational materials describing Gorge Commission activities and planning decisions shall be developed.

4. A community outreach program shall be conducted. Activities may include maintaining a speakers' bureau, meeting with county advisory committees, and participating in school programs.

5. Advice shall be provided to interested counties in designing and implementing their public involvement activities.

6. Formal public involvement and consultation activities shall be provided at major planning milestones.

    A. Formal public hearings shall be held before the Gorge Commission takes action on county land use ordinances, amends the Management Plan, or reviews and periodically revises the Management Plan. Any interested person shall be able to testify before the Gorge Commission.

    B. Written public comment shall be encouraged, and a comment period shall precede all major planning decisions. Commission rules should define the required comment period.

    C. Public comment shall be encouraged before the Gorge Commission takes action on county land use ordinances. The Gorge Commission shall approve land use ordinances at public hearings.

    D. Public workshops shall be held to encourage review of and comment on other Gorge Commission decisions. Workshops shall be conveniently scheduled to encourage participation by Gorge residents and other interested people.

    E. Revisions to Urban Area boundaries shall be considered after a formal public hearing by the Gorge Commission. Formal hearings shall be preceded by an informal hearing for general public comment. All interested people shall be able to make their comments known.

7. Periodic meetings of Gorge county planners and planning directors shall be scheduled to encourage ongoing discussion of issues and concerns.

8. Periodic consultation meetings shall be scheduled with Indian tribal governments to encourage ongoing discussion of issues and concerns.

9. Periodic consultation meetings shall be scheduled with county governing boards to encourage ongoing discussion of issues and concerns.

10. The two states shall be consulted about application of economic development grants and loans, restoration of the Historic Columbia River Highway, and activities of other state agencies.

11. The Commission should collaborate with the USDA Forest Service on all projects of mutual interest.

12. In designing implementation programs, public comment and assistance shall be solicited.

CHAPTER

2

Forest Service Role

Implementation of the Management Plan charters a federal presence with an expanded focus beyond traditional Forest Service roles. In addition to administration of the National Forest System (NFS) lands in the Scenic Area, the Forest Service will be actively involved as a partner and provider of technical support for state and local governments on non-federal lands.

The Forest Service has acquired, through purchase, exchange, or donation, approximately 34,000 acres of new federal land in the Scenic Area added to the existing national forests. In addition, approximately 40,000 acres of the Gifford Pinchot National Forest and the Mt. Hood National Forest are inside the boundary of the Scenic Area. Additional federal lands will be added as the land acquisition program continues. Management and protection of these federal lands will be carried out by the National Scenic Area Forest Service administrative unit.

Management responsibilities on NFS lands will include administration of recreation facilities; design of resource protection, management, and enhancement strategies on federal lands; and provision of public information and services to visitors, users, and other interested parties.

The Forest Service intends to implement strategies designed to protect and integrate resource management. Additional opportunities, such as providing leadership in cultural resources, anadromous fisheries, oak woodland and wetlands management, will be incorporated into ongoing administration of the NFS lands in the Scenic Area.

The National Scenic Area Forest Service administrative unit will continue to administer the White Salmon and Klickitat Wild and Scenic Rivers, as designated in the Scenic Area Act and guided by the management plans prepared for these areas.

Monitoring and technical assistance responsibilities will continue after adoption of the Management Plan, and the Forest Service will maintain an active and visible role with the Gorge Commission, the six counties, and others involved in those activities. Forest Service plans call for staffing to provide assistance in specialized areas, including biology, forestry, botany, and landscape architecture.

Revisions and amendments to the Management Plan will require review and involvement of the Forest Service. The need for revisions should be tied closely to monitoring conclusions.

The Geographic Information System (GIS) has been used by the Forest Service to maintain inventory information, analyze data, and generate maps as necessary for the creation of the Management Plan. The GIS will be maintained and updated for use by the counties, Gorge Commission, and Forest Service.

Section 16 of the Scenic Area Act authorizes funds for continuing land acquisitions, and provides $32.8 million for economic and recreation development programs. The Forest Service will administer the distribution of those funds, ensuring that the public interest is served and the purposes of the Scenic Area Act are fulfilled. Section 7(d) of the Scenic Area Act authorizes the Secretary of Agriculture to design, construct, operate, and maintain recreation facilities that are included in the recreation assessment for the Scenic Area. The Forest Service will participate in the development process, either directly by designing and building the facilities and administering the sites, or by facilitating partnerships with other providers and user groups.

The National Scenic Area Forest Service administrative unit is supervised by the National Scenic Area Manager, who reports to the Regional Forester and is responsible for local Scenic Area administration. The administrative office for this unit will be headquartered in Hood River, Oregon, to continue providing local contact and accessibility to public and agency partners in administering the Scenic Area.

LAND ADJUSTMENT

Landownership patterns within the Scenic Area are a complex pattern comprised of multiple ownerships and governmental jurisdictions. Intermingled ownerships greatly increase the probability of public trespass onto private land, private landowners encroaching on National Forest System land, and confusion by the public over where one ownership ends and a different one begins. There is also a high degree of urban interface within the Scenic Area that adds to management complexity and reduces management efficiency. Where mixed ownerships are found, access issues are usually more complicated and troublesome.

The Scenic Area contains approximately 292,615 acres, of which approximately 115,100 acres fall within the Special Management Area (SMA). Of the 115,100 acres, some 71,000 are comprised of National Forest System land. The remaining acreage is comprised of a multitude of ownerships including County, State, other Federal, Tribal and private.

The first purpose of the Scenic Area Act is "to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge" [Section 31]. Section 9 of the Scenic Area Act states that "The Secretary is authorized to acquire any lands or interests therein within the special management areas and the

Dodson/Warrendale Special Purchase Unit which the Secretary determines are needed to achieve the purposes of this Act."

The primary purpose of acquisition, then, is to protect or enhance the resources of the Scenic Area.

The acquisition philosophy of the Forest Service has been, and will generally continue to be, based on the "willing seller, willing buyer" concept, recognizing the Scenic Area Act's provisions and limitations on the use of eminent domain [Section 9].

Acquisitions of land and interests can occur through purchase, donation, or exchange. Acquisitions from states or political subdivisions may be made only through donations or exchange. Use of scenic or conservation easements is another method that can be used to protect or enhance a particular resource.

LAND ADJUSTMENT DIRECTION

Since passage of the Scenic Area Act, land acquisitions have occurred through 1) the timberland exchanges specifically directed in Section 9(d), 2) direct purchases of tracts fitting the "hardship" provision of Section 9(c), and 3) purchase of a number of key properties containing important scenic, cultural, or natural resources. There have also been some parcels acquired through donations. Most of the acquisitions have been from individuals who came to the Forest Service with an offer to sell.

The Scenic Area Act authorizes acquisition of any lands or interests therein within the special management areas and the Dodson/Warrendale Special Purchase Unit. In addition to the Scenic Area Act, there are other land adjustment authorities applicable to the Forest Service that allow acquisition of lands and interests outside of the two areas specified in the Scenic Area Act.

As of October 2003, the following funds have been expended and lands acquired:

Purchase:
16,803 acres acquired in fee
1,894 acres of partial interest acquisitions utilizing conservation easements
$54,991,849 funds expended

Land Exchange:
16,600 acres acquired through exchange

The Management Plan identifies resource opportunities and needs that are important to fulfill the purposes of the Scenic Area Act. Those opportunities will be the focus of the land acquisition program. The Forest Service will take a proactive role in negotiating with landowners to ascertain the availability for sale of lands that enhance resources identified in the plan.

The following criteria will be used for determining federal land acquisition:

- High-priority public recreation sites.
- Sensitive lands such as wetlands, riparian areas, and floodplains.
- Lands supporting threatened or endangered species of fish, wildlife, or plants.
- Lands designated Open Space where significant resources have been identified, and where uses or development may endanger the resources.
- Highly scenic lands that are visible from key viewing areas.
- Lands with known concentrations of cultural resource sites or a high probability of cultural resource sites.
- Consolidation for increased efficiency in land management.
- Rights-of-way needed for public access.

In many cases, more than one of the above conditions may appear on a site. If that is the case, the priority of the site for acquisition could be higher. Priorities will be determined by the degree to which offered properties meet one or more of the criteria and resource or project needs, the timing of acquisition to meet such need, and the availability of properties for sale by willing sellers.

The value of landownership consolidation cannot be overstated. Where ownerships occur in large blocks, there is reduced trespass, encroachment, access issues, and public confusion over differing regulatory requirements that occur with different management agencies. Management costs and boundary maintenance costs are also reduced, and there is less of a need to authorize third party uses on National Forest System land.

PURCHASE

Real property purchases in the Scenic Area can be accomplished by one of two methods. The first method is known as “fee” acquisition, and consists of acquisition of the entire group of rights associated with a property. Most lands purchased will be acquired in fee to provide the greatest degree of resource protection, management flexibility, and public benefit. The second method of purchase is known as partial interest acquisition in which only a specified group of rights is acquired and legal title remains vested with the private landowner. These acquisitions are commonly known as conservation easements or scenic easements. Very limited use will be made of this second method due to the perpetual costs of administration of the easements and the lesser public benefits derived from only owning a limited set of rights to a property.

LAND EXCHANGE

Although the land exchange authority set forth in the Scenic Area Act was limited in both scope and duration, the Scenic Area retains the ability to conduct land exchanges through broad authority given to the Forest Service by laws such as the Weeks Law Act of March 1, 1911 and the General Exchange Act of March 20, 1922. The use of land exchanges to consolidate landownership is considered a potentially important tool in accomplishing the goals and objectives of the Scenic Area. This is particularly true where there are intermingled ownerships involving National Forest System land and land owned by a State or political subdivision thereof. In particular, serious consideration should be given to exchange proposals between the Forest Service and State Park agencies that would consolidate ownership around public recreation sites. Land exchanges within the Scenic Area will be considered only if the scenic, cultural, recreational, or natural resources of the Scenic Area are not compromised. Exchanges are discretionary and must be found to be in the public interest. Land exchanges are typically costly, complex, and require a substantial amount of time and resource commitment to be successfully completed. It is expected that use of land exchange as a tool to accomplish the purposes of the Act will remain limited.

RIGHTS-OF-WAY NEEDED FOR PUBLIC ACCESS

Rights-of-way acquisition objectives include acquiring road and trail rights-of-way that are adequate for the protection, administration, and utilization of the National Forest System, and also acquiring all interests needed for use of roads and trails to meet the long-term management and multiple use objectives of National Forest System lands as set out in the Scenic Area management plan and Forest land and resource management plans.

Mixed ownerships and a multitude of private roads combine to make providing full public access to lands within the Scenic Area a challenge. The Recreation Development Proposals list identifies trails, campgrounds, and other visitor and administrative "facilities" that will need planned access, either by trail or road. Public access to some lands acquired chiefly for scenic, natural or cultural reasons may continue to be limited. Specific access needs will be identified in the Scenic Area's annual program of work. Negotiating for purchase, exchange, or donation of easements will be an important acquisition tool. Access needs offer opportunities for partnerships with a wide range of cooperators, including landowners and user groups.

EFFECT ON LOCAL GOVERNMENT FINANCES

The Scenic Area Act included several provisions for offsetting the potential reduction of local taxes as a result of federal land acquisition. Section 14(b) provides that acquired lands will be included in determining a county's share of timber receipts from National Forest System lands. Also, Section 14(c) provides for payments in lieu of taxes to a county for a certain period of time.

REVISION OF SMA BOUNDARIES

The Scenic Area Act [Section 4(c)] describes the following procedures for adjustments to SMA boundaries:

> The Secretary, in consultation with the Commission, may make minor revisions in the boundaries of special management areas after publication of notice to that effect in the Federal Register and submission of notice thereof to the Committee on Energy and Natural Resources of the United States Senate and the Committees on Agriculture and Interior and Insular Affairs of the United States House of Representatives.

The Scenic Area Act also requires publishing the proposed boundary revision in the Federal Register.

To date, one minor revision has been made to the SMA boundary at Rowena. As the Scenic Area Act requires, the procedure followed in that case will be used in any other boundary revision that might be appropriate. Changes in the SMA boundary will be considered where such changes would help enhance and protect scenic, cultural, recreation, and natural resources. In addition, Congress changed about 310 acres at Chenoweth Table in Wasco County, and about 27 acres at “Pioneer Point” in Skamania County from GMA to SMA.

MONITORING AND ENFORCEMENT

A comprehensive program to monitor implementation of the Management Plan is essential to ensure that the purposes of the Scenic Area Act are achieved. Monitoring should emphasize two components:

1. Are the guidelines being met through appropriate implementation of the county ordinances and other requirements?

2. Are the scenic, cultural, recreation, and natural resources being protected and enhanced through application of the management guidelines and implementation of enhancement and action program strategies?

Monitoring of county implementation actions is primarily the responsibility of the Gorge Commission, as required in Section 15 (a)(l)of the Scenic Area Act. However, in the SMA, where lands are being used or are in imminent danger of being used in a manner incompatible with the county ordinances, Section 9 gives the Forest Service the authority to acquire such lands without consent of the owner. Therefore, the Forest Service will also monitor actions in the SMA.

Counties will not have authority to implement all guidelines through county ordinances. In some cases, such as review of forest practices, the Forest Service will retain jurisdiction

to review uses or development and certify consistency with the Management Plan. Where this is the case, the Forest Service will monitor the results of these actions to ensure that required mitigation measures are implemented and the resources are protected.

Specific subjects and data elements for monitoring the resources are proposed below. A detailed monitoring program will be designed to include methodologies and show progress, problems, and proposed adjustments. Periodic reports are proposed to summarize the monitoring results and make recommendations to the Gorge Commission for any management changes that may be indicated by the findings.

SCENIC RESOURCES

The Management Plan goals for scenic resources call for protecting the scenic values on both the broad landscape setting level and the individual development level.

Much of the value of the Scenic Area is expressed in the opportunity to appreciate important vistas. The level of visibility affects the ability to appreciate the beauty of the landscape, especially the color and contrasting forms of distant features. Air pollution can impair the quality of the viewing experience, and should be monitored to ensure the protection of the clear views that everyone enjoys.

Aerial and oblique photographs will provide the monitoring record to assess changes to the scenery. A system of visual monitoring points was established in 1988. Twenty-seven sites in the Scenic Area were designated as monitoring points from which oblique panoramic photographs will be taken on a regular basis. This photography will be repeated every 5 to 10 years to measure changes in the landscape and identify problem areas.

In 1987 and 1988, complete sets of black and white and color vertical aerial photographs were taken for the entire Scenic Area. All or part of the Scenic Area can be re-photographed on a regular basis or as needed for a specific area. Analysis of the changes from a vertical perspective will supplement the panoramic photographic monitoring.

Monitoring of the scenic resources will address the following topics:

1. Effects of changes to the scenery that may have occurred from development, including cumulative effects.

2. Results of air quality visibility monitoring to assess changes to viewing ability.

3. Evaluation of county actions to assess the effectiveness of the county ordinances to protect scenic resources.

4. Effects on the scenic resource of enhancement activities performed during the preceding year.

CULTURAL RESOURCES AND TREATY RIGHTS

The Management Plan goal is to protect cultural resources from potential adverse effects. Site-specific inventory and analysis, consultation with Indian tribes, and design of mitigation measures are required to implement this goal. Expanded and strengthened law enforcement efforts will also be developed to reduce or minimize theft and vandalism of cultural resources.

Scenic Area inventories include identification of known cultural resources and will be expanded to include data on resources located during site inventories and analysis for new developments.

The monitoring program will address the following topics:

1. Effectiveness of the guidelines for protecting cultural resources, including county implementation.

2. Summary of cultural resources located during the previous year. Site-specific data will not be included in any report released to the public.

3. Effectiveness of law enforcement efforts for preventing vandalism of cultural resource sites.

4. Evaluation of Indian treaty right protection measures.

NATURAL RESOURCES

Natural resources in the Columbia River Gorge are varied and extensive. The Management Plan goal to protect and enhance those resources therefore involves a broad program with participation by numerous agencies focused on the many different elements in the environment.

Baseline information in the Scenic Area inventories is not, for the most part, site specific. More detailed information will be gathered over time, particularly for those natural resources most at risk. The monitoring program will be designed in conjunction with the many agencies with responsibility for managing and protecting the resources.

In addition, organizations such as the Nature Conservancy, Audubon Society, and the Native Plant Society maintain data bases and expertise relative to various natural resources. Their assistance could help ensure a strong and effective monitoring program.

The monitoring program will address the following topics:

1. Effects on fish, wildlife and plant habitat and populations resulting from development actions, including cumulative effects.

2. Results of county actions to assess the effectiveness of the county ordinances in protecting natural resources.

3. Effects and results of natural resource enhancement activities.

4. Establishment of a wetlands and riparian area database for the entire Scenic Area.

5. Water quality.

OPEN SPACE

Open Space lands are important to protect the scenic, cultural, recreation, and natural resources of the Scenic Area. Monitoring will address the following topics:

1. Progress towards completion of Open Space management plans for designated areas.

2. Protection and enhancement projects or activities undertaken in Open Space areas.

3. Effectiveness of guidelines to protect Open Space resources.

FOREST AND AGRICULTURAL LANDS

Forest and agricultural lands are important elements of the economic base of the Scenic Area and provide a variety of other benefits, including scenic and natural resources.

Monitoring will address the following topics:

1. Compliance with the forest practices guidelines established for the Scenic Area, including mitigation for adverse effects on scenic, cultural, recreational, and natural resources.

2. The effectiveness of the forest and agricultural land use guidelines to ensure sustained productivity of forest and agricultural products.

3. The condition of forest lands in terms of health, disease, and protection from conversion.

4. Effectiveness of cooperative fire protection and management strategies.

5. Protection of wetlands and riparian areas from agricultural practices.

6. Effectiveness of county implementation of guidelines protecting agricultural and forest lands from conversion.

RECREATION

Recreation is a fast-changing component of the Scenic Area. Changes in visitation could affect both the quality of the recreation experience and the other resources. Since recreation development funds are limited, it is important to analyze the effectiveness of the development program and adjust it as necessary.

Monitoring will include the following topics:

1. Effectiveness of the guidelines to protect the recreation resource, including compliance with recreation intensity class guidelines.

2. Tabulation of annual recreation visitation to the Scenic Area.

3. Status report of annual recreation development and enhancement projects and funds expended in the Scenic Area.

4. Assessment of whether new recreation developments, such as the Scenic Area Conference Center and the Interpretive Center, have met recreation objectives, policies, and guidelines.

5. Monitoring use at the most popular sites, such as Multnomah Falls, to determine if strategies are required to avoid overuse and damage to resources.

LAND ACQUISITION

The monitoring report will track land adjustment activities. Monitoring will include the following topics:

1. The amount of land purchased or acquired through exchange or easements.

2. Funds expended annually and cumulatively for land acquisition in the Scenic Area.

3. Compliance with scenic and conservation easement conditions.

ECONOMIC DEVELOPMENT

The Scenic Area Act provides a number of measures to enhance the economy of the Scenic Area. These measures include protection of agricultural and forest lands; provision of economic development funds; and funding for recreation, interpretation, and conference facilities. Monitoring will include the following topics:

1. Compilation of available data regarding employment by principal sectors of the Scenic Area economy.

2. Changes in recreation and tourism visitation.

3. Effectiveness of recreation and tourism marketing efforts.

4. Review of economic activities undertaken with federal Scenic Area funding, as reported in each state's annual report in accordance with Section 11(d) of the Scenic Area Act.

NATIONAL FOREST SYSTEM LANDS DIRECTION

Section 8(a) of the Scenic Area Act provides the following direction for National Forest System lands in the SMA:

> The Secretary shall administer Federal lands within the special management areas in accordance with this Act and other laws, rules and regulations applicable to the National Forest System.

Direction for management of National Forest System lands is provided in this Management Plan and in the *Land and Resource Management Plan* for Mt. Hood National Forest (1990) and *Land and Resource Management Plan* for Gifford Pinchot National Forest (1990), as amended by the Northwest Forest Plan. These National Forest management plans were completed according to the National Forest Management Act (NFMA) and the National Environmental Policy Act (NEPA) and include alternative analysis and direction for resource management.

Special Management Area water resource buffer widths shall be applied to National Forest System lands in the General Management Area, and forest practices on National Forest System lands in the General Management Area shall comply with the Special Management Area forest practice guidelines. Projects undertaken on National Forest System lands must comply with direction in the Management Plan and the two National Forest management plans, as amended by the Northwest Forest Plan. The most protective standards of the National Scenic Area Management Plan or the respective Forest Land and Resource Management Plans (as amended by the Northwest Forest Plan) shall apply to National Forest System lands.

Section 8(a) also provides that:

> The construction of roads and the management, utilization and harvest of timber on Federal lands within the special management areas also shall be subject to Forest Service visual resource management guidelines.

The Mt. Hood and the Gifford Pinchot National Forest management plans and this Management Plan provide direction as to visual quality objectives for National Forest System lands.

According to the Mt. Hood and Gifford Pinchot National Forest management plans, as amended, regulated commercial timber harvesting would not occur on the National Forest System lands within the Scenic Area. Any timber harvesting on National Forest System lands that would occur shall meet the assigned visual quality objective.

Section 8(a) further directs that:

> The Secretary shall utilize lands acquired through exchange in calculating the allowable sales quantity on the Gifford Pinchot and Mt. Hood National Forests.

This requirement will be addressed in subsequent revisions of the Mt. Hood and Gifford Pinchot National Forest management plans. Section 9(a) of the Scenic Area Act also requires that acquired lands be subject to the Scenic Area regulations in accordance with this Management Plan.

As provided for in Section 17(f)(l) of the Scenic Area Act, Forest Service actions taken for the development of this Management Plan, land acquisition, and interim management are exempt from the National Environmental Policy Act (NEPA). However, Forest Service implementing actions taken subsequent to the adoption of this plan must comply with all laws and regulations applicable to National Forest System lands, including NEPA.

CHAPTER

3

Indian Tribal Treaty Rights and Consultation

TREATY RIGHTS AND CONSULTATION IN THE GMA

The Nez Perce, Umatilla, Warm Springs, and Yakama Indian tribes signed treaties with Congress in 1855. These treaties ceded to the United States legal title to millions of acres of land. They also reserved and guaranteed certain aboriginal rights exercised by Indian people since time immemorial. These legally protected rights belong to each Indian tribe and are regulated and enforced by the respective Indian tribal governments. The Indian tribal governments exercise inherent sovereign powers, as limited by treaty or act of Congress.

The language and legislative history of the Scenic Area Act make it clear that Congress intended to protect the rights and sovereign powers of the Indian tribes. Section 17(a)(1) of the Scenic Area Act states that nothing shall "affect or modify any treaty or other rights of any Indian tribe." Indian tribal governments were also ensured a role in the management processes established under the Scenic Area Act. Section 6(e) states that the U.S. Secretary of Agriculture and the Gorge Commission must "exercise their responsibilities . . . in consultation with . . . Indian tribes." Additional language regarding tribal rights and roles appears in Sections 6(a)(3)(C), 8(d)(3), 9(b)(2)(D), 13(b), 17(a)(2), 17(a)(3), 17(a)(4), 17(a)(7), and 17(a)(8).

Indian treaty rights must be observed by the Gorge Commission as well as local and state governments, federal agencies, and private citizens. Indian treaties provide that:

> The exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations in common with citizens of the United States, and of erecting suitable buildings for curing the same; the privilege of hunting, gathering roots and berries and pasturing their stock on unclaimed lands in common with citizens is also secured to them. [Treaty with the Cayuse, Walla Walla, and Umatilla Tribes, 1855.]

This excerpt is similar to the language in the treaties signed by the Nez Perce, Warm Springs, and Yakama tribes.

"Usual and accustomed stations" include the Columbia River and its tributaries that support anadromous and resident fish. The courts have generally interpreted "unclaimed lands" to mean all public lands.

GMA Goal

Ensure that the Scenic Area Act and its application do not affect or modify any treaty or other rights of any Indian tribe.

GMA Policies

1. Local governments shall notify the four Indian tribal governments when new uses are proposed on lands where tribal members exercise treaty or other rights.

2. Indian tribal governments shall have an opportunity to review and comment on new uses that are proposed on lands, or in waters, where tribal members exercise treaty or other rights.

3. Project applicants shall consult Indian tribal governments that submit substantive comments about proposed uses that may affect or modify treaty or other rights.

4. Proposed uses that would affect or modify treaty or other rights of any Indian tribe shall be prohibited.

GMA Guidelines

Tribal Government Notice and Comment Period

1. Local governments shall send a notice to the four tribal governments when new uses are (1) proposed on public lands, or (2) proposed in or adjacent to the Columbia River or its tributaries that support anadromous or resident fish.

   Public lands include lands owned by cities, counties, states, and the United States. Lands adjacent to the Columbia River or its fishbearing tributaries are those lands that are situated directly between the Columbia River or its fishbearing tributaries and the closest public access point. Public access points include state highways and parks. The wildlife inventory in the "Streams, Ponds, Lakes, and Riparian Areas" section (Part I, Chapter 4: Natural Resources) identifies all tributaries in the Scenic Area that support anadromous and resident fish.

2. Notices sent to the Indian tribal governments shall include a site plan. As specified in guidelines 3 and 4 below, the notices also may require supplemental information and treaty rights protection plans.

3. New uses located in, or providing recreation river access to, the Columbia River or its fishbearing tributaries shall include the following supplemental information:

   A. The site plan map shall show adjacent river areas at least 1/2 mile upstream and downstream from the project site, the locations at which river access is

planned, and the locations of all tribal fishing sites known to the project applicant.

B. The site plan text shall include an assessment of the potential effects that new uses may have on Indian treaty rights. The assessment shall:

(1) Describe the type of river access and uses proposed, estimated period when the development would be used, and anticipated levels of use (people, boats, and other uses) during peak-use periods.

(2) List tribal commercial fishing seasons in the project vicinity, as established by the four treaty tribes.

(3) List tribal ceremonial fishing seasons in the project vicinity.

(4) Based on the above factors, assess the potential effects that the proposed uses may have on Indian treaty rights.

4. Notices shall include a treaty rights protection plan if new uses may affect Indian treaty rights. The protection plan shall specify measures that will be used to avoid effects to Indian treaty rights. These measures may include reducing the size and modifying the location or design of the proposed uses, seasonal closures, stringent onsite monitoring, information signs, and highly visible buoys or other markers delineating fishing net locations.

5. Indian tribal governments shall have 20 calendar days from the date a notice is mailed to submit substantive written comments to the local government. Indian tribal governments must identify the treaty rights that exist in the project vicinity and explain how they would be affected or modified by the new uses.

Tribal Government Consultation

1. When substantive written comments are submitted to a local government in a timely manner, the project applicant shall offer to meet with the local government and the Indian tribal government that submitted comments within 10 calendar days. The 10-day consultation period may be extended upon agreement between the project applicant and the Indian tribal government.

   Consultation meetings should provide an opportunity for the project applicant and tribal representatives to identify potential conflicts and explore options to eliminate them. The project applicant must demonstrate that his/her proposed use would not affect or modify treaty or other rights of any Indian tribe.

2. Any substantive comments, recommendations, or concerns expressed by Indian tribal governments during the consultation meeting shall be recorded and addressed by the project applicant in a treaty rights protection plan. The protection plan shall include measures to avoid effects to treaty and other rights of any Indian tribe.

3. The local government shall submit all protection plans to the Indian tribal governments. Indian tribal governments shall have 30 calendar days from the date a protection plan is mailed to submit written comments to the local government.

Conclusion of the Treaty Rights Protection Process

1. The local government shall decide whether the proposed uses would affect or modify any treaty or other rights of any Indian tribe.

   The final decision shall integrate findings of fact that address any substantive comments, recommendations, or concerns expressed by Indian tribal governments. If the final decision contradicts the comments, recommendations, or concerns of Indian tribal governments, the local government must justify how it reached an opposing conclusion.

2. The treaty rights protection process may conclude if the local government determines that the proposed uses would not affect or modify treaty or other rights of any Indian tribe. Uses that would affect or modify such rights shall be prohibited.

3. A finding by the local government that the proposed uses would not affect or modify treaty or other rights, or a failure of an Indian tribe to comment or consult on the proposed uses as provided in these guidelines, in no way shall be interpreted as a waiver by the Indian tribe of a claim that such uses adversely affect or modify treaty or other tribal rights.

TREATY RIGHTS AND CONSULTATION IN THE SMA

The Forest Service is responsible for consulting with Indian tribal governments at the government-to-government level. The purpose of this process is to ensure that management activities will not affect treaty rights, and to provide meaningful participation in the identification, evaluation, and protection of cultural resources.

Section 17 (Savings Provisions) of the Scenic Area Act contains several provisions regarding the need to avoid potential effects on treaty rights. Treaty rights are defined by the treaties of 1855 between Congress and Indian tribal governments. These rights are not subject to negotiation. Potential effects to treaty rights must be avoided. The Forest Service has no authority to interpret or negotiate in the area of treaty rights.

Cultural resources are protected by the Scenic Area Act and the Historic Preservation Act of 1966. Indian tribal governments are identified as parties to be consulted during the inventory, evaluation, and protection of cultural resources.

SMA Goals

1. Protect treaty and other rights of the Indian tribal governments.

2. Provide for a consultation process with Indian tribal governments.

SMA Policies

1. The Forest Service shall consult with the Indian tribal governments to determine the effect of all federal actions reviewed by the Forest Service on treaty rights. Reviewing agencies shall use the procedures defined by the Gorge Commission for the GMA for all non-federal actions.

2. The Forest Service shall establish a government-to-government consultation process between each Indian tribal government and the Forest Service, in accordance with the following:

   A. The Scenic Area Manager shall be the agency official for the Forest Service, National Scenic Area, who is responsible for making decisions regarding treaty rights issues and potential effects on cultural resources.

   B. The Indian tribal governments shall be the recognized entities for the purpose of authorizing decisions regarding treaty rights issues or potential effects to cultural resources.

C. The Scenic Area Manager shall designate the Forest Service representative for the purpose of maintaining a continuing working relationship with the Indian tribal governments.

D. The Indian tribal government should designate representatives for the purpose of maintaining a continuing working relationship with the Forest Service, National Scenic Area.

3. A continuing working relationship between the Forest Service and the Indian tribal governments shall be established.

A. The Forest Service shall enter into Memoranda of Understanding with each of the Indian tribal governments for the purpose of outlining consultation agreements, as provided for in Part I, Chapter 2: Cultural Resources.

B. The Memoranda of Understanding should identify key staff at each Indian tribal government to work with the Forest Service, National Scenic Area, designee.

C. The Memoranda of Understanding should establish procedures by which the Forest Service will consult with Indian tribal governments for proposed developments or changes in use.

D. The Memoranda of Understanding should establish the process by which the Forest Service will consult with Indian tribal governments for all proposed developments or changes in use that may have the potential to affect treaty rights or other uses.

E. The Memoranda of Understanding should establish the government-to-government process by which Indian tribal governments and the Forest Service, National Scenic Area, meet individually to identify potential treaty rights issues for potential developments or changes in use.

F. The Memoranda of Understanding should establish a mutually agreeable process by which meetings and decisions between the Indian tribal governments and the Forest Service, National Scenic Area, are documented.

4 Lands held in trust by the Secretary of Interior for Indian tribes or individual members of Indian tribes shall not be affected by any provisions of the Management Plan.

5. Lands acquired by the U.S. Army Corps of Engineers and administered by the Secretary of Interior for the benefit of Indian tribes and individual members of Indian tribes under Public Laws 14 and 100-581 (in-lieu sites), including those yet to be selected by the U.S. Army Corps of Engineers within the Bonneville Pool under the provisions of Public Law 100-581, Section 401(b)(1), shall not be affected by the SMA Management Plan for the Scenic Area.

6. New uses and development shall not affect or modify any treaty or other rights of the Indian tribal governments.

7. Any revisions or amendments to the Management Plan shall require consultation with the Indian tribal governments.

8. New developments or land use shall protect access to usual and accustomed tribal or Indian fishing sites or stations protected under treaty rights, and as established by court interpretations of those treaties.

9. Indian tribal governments shall be invited to participate in the planning of public recreation developments that could affect treaty rights.

10. Federal land management agencies shall not deny Indian tribal governments, or individual members of Indian tribes, access to any area on federal or state land that is traditionally used in connection with tribal treaty or ceremonial rights or for traditional uses.

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA ACT[1]

(as amended through November 2003)

16 U.S.C. § 544 **Sec. 2. Columbia River Gorge National Scenic Area; definitions**

As used in sections 544 to 544p of this title, the term –

(a) "adversely affect" or "adversely affecting" means, except as used in section 544m of this title, a reasonable likelihood of more than moderate adverse consequences for the scenic, cultural, recreation or natural resources of the scenic area, the determination –of which is based on -
  (1) the context of a proposed action;
  (2) the intensity of a proposed action, including the magnitude and duration of an impact and the likelihood of its occurrence;
  (3) the relationship between a proposed action and other similar actions which are individually insignificant but which may have cumulatively significant impacts; and
  (4) proven mitigation measures which the proponent of an action will implement as part of the proposal to reduce otherwise significant affects to an insignificant level;

(b) "agricultural lands" means lands designated as agricultural lands pursuant to section 544d of this title;

(c) "Commission" means the Columbia River Gorge Commission established pursuant to section 544c of this title;

(d) "counties" means Hood River, Multnomah, and Wasco Counties, Oregon; and Clark, Klickitat, and Skamania Counties, Washington;

(e) "Dodson/Warrendale Special Purchase Unit" means the Dodson/Warrendale Special Purchase Unit established pursuant to section 544b of this title;

(f) "forest lands" means lands designated as forest lands pursuant to section 544d of this title;

(g) "Indian tribes" means the Nez Perce Tribe, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Warm Springs of Oregon, and the Confederated Tribes of the Umatilla Indian Reservation;

(h) "interim guidelines" means any interim guidelines developed by the Secretary pursuant to section 544h of this title, and any amendment, revision, or variance;

(i) "land use ordinance" or "ordinance" means any ordinance adopted by a county or by the Commission pursuant to sections 544 to 544p of this title, and includes any amendment to, revision of, or variance from such ordinance;

(j) "major development actions" means any of the following:
  (1) subdivisions, partitions and short plat proposals;
  (2) any permit for siting or construction outside urban areas of multifamily residential, industrial or commercial facilities, except such facilities as are included in the recreation assessment;
  (3) the exploration, development and production of mineral resources unless such exploration, development or production can be conducted without disturbing the surface of any land within the boundaries of a special management area or is for sand, gravel and crushed rock used for the construction, maintenance or reconstruction of roads within the special management areas used for the production of forest products; and

[1] Note: This compilation was downloaded from *http://uscode.house.gov/*. This compilation does not include any of the codification notes except for footnotes and legislative source notes. While the Columbia River Gorge Commission believes this is an accurate compilation as of the date stated above, persons relying on this compilation do so at their own risk. All persons are advised to seek the assistance of an attorney.

(4) permits for siting or construction within a special management area of any residence or other related major structure on any parcel of land less than forty acres in size;

(k) "management plan" means the scenic area management plan adopted pursuant to section 544d of this title;

(l) "open spaces" means unimproved lands not designated as agricultural lands or forest lands pursuant to section 544d of this title and designated as open space pursuant to section 544d of this title. Open spaces include –
(1) scenic, cultural, and historic areas;
(2) fish and wildlife habitat;
(3) lands which support plant species that are endemic to the scenic area or which are listed as rare, threatened or endangered species pursuant to State or Federal Endangered Species Acts;
(4) ecologically and scientifically significant natural areas;
(5) outstanding scenic views and sites;
(6) water areas and wetlands;
(7) archaeological sites, Indian burial grounds and village sites, historic trails and roads and other areas which are culturally or historically significant;
(8) potential and existing recreation resources; and
(9) Federal and State wild, scenic, and recreation waterways;

(m) "recreation assessment" means the recreation assessment adopted pursuant to section 544d of this title;

(n) "residential development" means the permitting for siting or construction of any residence or other related major structure;

(o) "scenic area" means the Columbia River Gorge National Scenic Area established pursuant to section 544b of this title;

(p) "Secretary" means the Secretary of Agriculture;

(q) "special management areas" means areas within the scenic area established pursuant to section 544b of this title;

(r) "States" means the States of Oregon and Washington; and

(s) "urban areas" means those areas within the scenic area identified as urban areas on the map referred to in section 544b(e) of this title or within the boundaries of an urban area as revised pursuant to section 544b(f) of this title.

(Pub. L. 99-663, Sec. 2, Nov. 17, 1986, 100 Stat. 4274; Pub. L. 103-435, Sec. 17(b), Nov. 2, 1994, 108 Stat. 4573.)

§ 544a Sec. 3. Purposes

The purposes of sections 544 to 544p of this title are –
(1) to establish a national scenic area to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge; and
(2) to protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with paragraph (1)

(Pub. L. 99-663, Sec. 3, Nov. 17, 1986, 100 Stat. 4276.)

§ 544b Sec. 4. Establishment of scenic area

(a) National scenic area
(1) There is hereby established the Columbia River Gorge National Scenic Area.
(2) Boundaries. –
(A) In general. – Except as provided in subparagraph (B), the boundaries of the scenic area shall be generally depicted on the map entitled "Boundary Map, Columbia River Gorge National Scenic Area," numbered NSA-001 sheets 1 and 2, and dated September 1986, which shall be on

file and available for public inspection in the offices of the Commission and of the Chief, Forest Service.

(B) Exclusions. – The scenic area shall not include the approximately 29 acres of land owned by the Port of Camas-Washougal in the South 1/2 of Section 16, Township 1 North, Range 4 East, and the North 1/2 of Section 21, Township 1 North, Range 4 East, Willamete[2] Meridian, Clark County, Washington, that consists of -

(i) the approximately 19 acres of Port land acquired from the Corps of Engineers under the Second Supplemental Appropriations Act, 1984 (Public Law 98-396); and

(ii) the approximately 10 acres of adjacent Port land to the west of the land described in clause (i)

(b) Special management areas

(1) The following areas within the boundaries of the scenic area are hereby designated "Special Management Areas": Gates of the Columbia River Gorge; Wind Mountain; Burdoin Mountain; and Rowena.

(2) The boundaries of the special management areas designated by paragraph (1) –

(A) shall be generally depicted on the map entitled "Special Management Areas, Columbia River Gorge National Scenic Area", numbered SMA-002 sheets 1 through 17, and dated September 1986, which shall be on file and available for public inspection in the offices of the Commission and of the Chief, Forest Service; and

(B) shall include all islands within the boundaries of the scenic area.

(3) Modification of boundaries. - The boundaries of the special management areas are modified as depicted on a map dated September 20, 2000, which shall be on file and available for public inspection in the office of the Chief of the Forest Service in Washington, District of Columbia, and copies shall be available in the office of the Commission, and the headquarters of the scenic area.

(c) Revision of special management area boundaries. The Secretary, in consultation with the Commission, may make minor revisions in the boundaries of special management areas after publication of notice to that effect in the Federal Register and submission of notice thereof to the Committee on Energy and Natural Resources of the United States Senate and the Committees on Agriculture and Natural Resources of the United States House of Representatives. Such notice shall be published and submitted at least sixty days before the revision is made. Notice of final action regarding such revision shall also be published in the Federal Register.

(d) Dodson/Warrendale Special Purchase Unit

(1) There is hereby established the Dodson/Warrendale Special Purchase Unit.

(2) The boundaries of the Dodson/Warrendale Special Purchase Unit shall be generally depicted on the map entitled "Dodson/Warrendale Special Purchase Unit, Columbia River Gorge National Scenic Area", numbered SPU-003 sheet 1, and dated September 1986, which shall be on file and available for public inspection in the offices of the Commission and of the Chief, Forest Service.

(e) Urban areas

(1) The following cities and towns are hereby designated as "Urban Areas": Cascade Locks, Hood River, Mosier, and The Dalles, Oregon; and Bingen, Carson, Dallesport, Home Valley, Lyle, North Bonneville, Stevenson, White Salmon, and Wishram, Washington.

(2) The boundaries of urban areas shall be generally depicted on the map entitled, "Urban Areas, Columbia River Gorge National Scenic Area", numbered UA-004 sheets 1 through 11, and dated September 1986, which shall be on file

[2] So in original. Probably should be "Willamette".

and available for public inspection in the offices of the Commission and of the Chief, Forest Service. The boundaries of urban areas designated in this subsection may be revised pursuant to the provisions of this section.

(f) Revision of urban area boundaries

(1) Upon application of a county and in consultation with the Secretary, the Commission may make minor revisions to the boundaries of any urban area identified in subsection (e) of this section. A majority vote of two-thirds of the members of the Commission, including a majority of the members appointed from each State, shall be required to approve any revision of urban area boundaries.

(2) The Commission may revise the boundaries of an urban area only if it finds that -

(A) a demonstrable need exists to accommodate long-range urban population growth requirements or economic needs consistent with the management plan;

(B) revision of urban area boundaries would be consistent with the standards established in section 544d of this title and the purposes of sections 544 to 544p of this title;

(C) revision of urban area boundaries would result in maximum efficiency of land uses within and on the fringe of existing urban areas; and

(D) revision of urban area boundaries would not result in the significant reduction of agricultural lands, forest lands, or open spaces.

(Pub. L. 99-663, Sec. 4, Nov. 17, 1986, 100 Stat. 4276; Pub. L. 103-437, Sec. 6(d)(34), Nov. 2, 1994, 108 Stat. 4585; Pub. L. 105-277, div. A, Sec. 101(e) (title III, Sec. 354(a)), Oct. 21,1998, 112 Stat. 2681-231, 2681-303; Pub. L. 106-31, title V, Sec.5004(3), May 21, 1999, 113 Stat. 110; Pub. L. 106-291, title III, Sec. 346(d), Oct. 11, 2000, 114 Stat. 1000.)

§ 544c Sec. 5. Columbia River Gorge Commission

(a) Establishment and membership of Commission

(1) To achieve the purposes of sections 544 to 544p of this title and to facilitate cooperation among the States of Oregon and Washington, and with the United States of America, the consent of Congress is given for an agreement described in sections 544 to 544p of this title pursuant to which, within one year after November 17, 1986 -

(A) the States of Oregon and Washington shall establish by way of an interstate agreement a regional agency known as the Columbia River Gorge Commission, and shall incorporate sections 544 to 544p of this title by specific reference in such agreement. The Commission shall carry out its functions and responsibilities in accordance with the provisions of the interstate agreement and of sections 544 to 544p of this title and shall not be considered an agency or instrumentality of the United States for the purpose of any Federal law;

(B) the States of Oregon and Washington shall provide to the Commission, State agencies, and the counties under State law the authority to carry out their respective functions and responsibilities in accordance with the provisions of paragraph (1)(A) of this subsection; and

(C) the States of Oregon and Washington shall appoint members of the Commission as provided in clauses (i) through (iii), subject to applicable State law: Provided, That the Governor of either State may extend the time for appointment of Commission members ninety days to provide more time for the States and counties to make such appointments. Membership of the Commission shall be as follows:

(i) six members, comprised of one resident from each of the following counties: Hood River, Multnomah, and Wasco Counties, Oregon, and Clark, Klickitat, and Skamania Counties, Washington, to be

appointed by the governing body of each of the respective counties: Provided, That in the event the governing body of a county fails to make such appointment, the Governor of the State in which the county is located shall appoint such member;

(ii) three members who reside in the State of Oregon, at least one of whom shall be a resident of the scenic area, to be appointed by the Governor of Oregon;

(iii) three members who reside in the State of Washington, at least one of whom shall be a resident of the scenic area, to be appointed by the Governor of Washington; and

(iv) one ex officio, nonvoting member who shall be an employee of the Forest Service, to be appointed by the Secretary.

(2) The agreement shall take effect and the Commission may exercise its authorities pursuant to the agreement upon the appointment of four initial members from each State, subject to applicable State law, and the date of such an agreement shall be the date of establishment of the Commission. Such agreement is hereby consented to by the Congress.

(3) Either State or any county may fill any vacancy occurring prior to the expiration of the term of any member originally appointed by that State or county. Each member appointed to the Commission shall serve a term of four years, except that, with respect to members initially appointed pursuant to paragraph (1)(C)(i), each Governor shall designate one member to serve for a term of five years and one to serve for a term of six years, and one member from each State initially appointed pursuant to paragraph (1)(C)(ii) and (iii) shall be designated by the Governor to serve a term of five years, and one to serve a term of six years. Neither the Governors nor the governing bodies of any of the counties may appoint Federal, State, or local elected or appointed officials to the Commission.

(4) A majority of the members of the Commission shall constitute a quorum. The members of the Commission shall select from among themselves a Chairman by majority vote of the members appointed from each State.

(5) Except for the ex-officio member appointed pursuant to paragraph (1)(C)(iv), the members and officers and employees of the Commission shall not be officers or employees of the United States for any purpose. The Commission shall appoint, fix compensation for, and assign and delegate duties to such officers and employees as the Commission deems necessary to fulfill its functions under sections 544 to 544p of this title. The compensation of Commission members shall be fixed by State law. The compensation of Commission members, officers, and employees and the expenses of the Commission shall be paid from funds provided to the Commission by the States.

(b) Applicable law. For the purposes of providing a uniform system of laws, which, in addition to sections 544 to 544p of this title, are applicable to the Commission, the Commission shall adopt regulations relating to administrative procedure, the making of contracts, conflicts-of-interest, financial disclosure, open meetings of the Commission, advisory committees, and disclosure of information consistent with the more restrictive statutory provisions of either State. Regulations applicable to financial disclosure under this subsection shall be applied to members of the Commission without regard to the duration of their service on the Commission or the amount of compensation received for such service. No contract, obligation, or other action of the Commission shall be an obligation of the United States or an obligation secured by the full faith and credit of the United States.

(c) Assistance to Commission. Upon the request of the Commission, the Secretary and other Federal agencies are authorized to provide information, personnel, property, and services on a reimbursable basis, and the Secretary is authorized to provide technical assistance on a nonreimbursable basis, to the Commission to assist it in carrying out its functions and responsibilities pursuant to sections 544 to 544p of this title.

(d) Advisory committees. The Commission shall establish voluntary technical and citizen advisory committees to assist the Commission in carrying out its functions and responsibilities pursuant to sections 544 to 544p of this title.

(Pub. L. 99-663, Sec. 5, Nov. 17, 1986, 100 Stat. 4277.)

§ 544d Sec. 6. Scenic area management plan

(a) Studies. Within one year after the date the Commission is established, it shall, in cooperation with the Secretary, complete the following studies for use in preparing the management plan:

(1) Resource inventory. The Commission shall complete a resource inventory. The resource inventory shall –

(A) document all existing land uses, natural features and limitations, scenic, natural, cultural, archaeological and recreation and economic resources and activities: Provided, That the location of any Indian burial grounds, village sites, and other areas of archaeological or religious significance shall not be made public information and such information shall be used for administrative purposes only; and

(B) incorporate without change the resource inventory developed by the Secretary pursuant to section 544f of this title for the special management areas.

(2) Economic opportunity study. The Commission shall complete a study to identify opportunities to enhance the economies of communities in the scenic area in a manner consistent with the purposes of sections 544 to 544p of this title.

(3) Recreation assessment. The Commission shall complete an assessment of recreation resources and opportunities for enhancement of these resources. The recreation assessment shall –

(A) designate the location and specify the construction of an interpretive center or other appropriate facility, to be located in the State of Oregon, and of a conference center or other appropriate facility, to be located in the State of Washington;

(B) identify areas within the scenic area that are suitable for other public use facilities, including but not limited to educational and interpretive facilities, campsites, picnic areas, boat launch facilities and river access areas; and

(C) subject to the treaty and other rights of Indian tribes, designate areas to provide increased access for recreation purposes to the Columbia River and its tributaries; and

(D) incorporate without change the recreation assessment developed by the Secretary pursuant to section 544f of this title for the special management areas;

(b) Land use designations. Within two years after the Commission is established, it shall develop land use designations for the use of non-Federal lands within the scenic area. The land use designations shall –

(1) be based on the results of the resource inventory developed pursuant to subsection (a)(1) of this section, and consistent with the standards established in subsection (d) of this section;

(2) designate those lands used or suitable for the production of crops, fruits or other agricultural products or the sustenance of livestock as agricultural lands;
(3) designate lands used or suitable for the production of forest products as forest lands;
(4) designate lands suitable for the protection and enhancement of open spaces;
(5) designate areas in the scenic area outside special management areas used or suitable for commercial development: Provided, That such designation shall encourage, but not require, commercial development to take place in urban areas and shall take into account the physical characteristics of the areas in question and their geographic proximity to transportation, commercial, and industrial facilities and other amenities;
(6) designate areas used or suitable for residential development, taking into account the physical characteristics of the areas in question and their geographic proximity to transportation and commercial facilities and other amenities; and
(7) incorporate without change the designation of urban areas established in section 544b(e) of this title.

(c) Adoption of management plan. Within three years after the date the Commission is established, it shall adopt a management plan for the scenic area. The Commission shall adopt the management plan by a majority vote of the members appointed, including at least three members from each State. The management plan shall -
(1) be based on the results of the resource inventory developed pursuant to subsection (a)(1) of this section;
(2) include land use designations developed pursuant to subsection (b) of this section;
(3) be consistent with the standards established in subsection (d) of this section;
(4) incorporate without change the management direction for the use of Federal lands within and the land use designations for the special management areas adopted by the Secretary pursuant to section 544f of this title; and
(5) include guidelines for the adoption of land use ordinances for lands within the scenic area. The guidelines –
(A) shall incorporate without change the guidelines for the development of special management area land use ordinances developed by the Secretary pursuant to section 544f of this title; and
(B) shall not apply to urban areas designated in section 544b(e) of this title.

(d) Standards for management plan. The management plan and all land use ordinances and interim guidelines adopted pursuant to sections 544 to 544p of this title shall include provisions to -
(1) protect and enhance agricultural lands for agricultural uses and to allow, but not require, conversion of agricultural lands to open space, recreation development or forest lands;
(2) protect and enhance forest lands for forest uses and to allow, but not require, conversion of forest lands to agricultural lands, recreation development or open spaces;
(3) protect and enhance open spaces;
(4) protect and enhance public and private recreation resources and educational and interpretive facilities and opportunities, in accordance with the recreation assessment adopted pursuant to subsection (a) of this section;
(5) prohibit major development actions in special management areas, except for partitions or short plats which the Secretary determines are desirable to facilitate land acquisitions pursuant to sections 544 to 544p of this title;
(6) prohibit industrial development in the scenic area outside urban areas;

(7) require that commercial development outside urban areas take place without adversely affecting the scenic, cultural, recreation, or natural resources of the scenic area;
(8) require that residential development outside urban areas take place without adversely affecting the scenic, cultural, recreation, and natural resources of the scenic area; and
(9) require that the exploration, development and production of mineral resources, and the reclamation of lands thereafter, take place without adversely affecting the scenic, cultural, recreation and natural resources of the scenic area.

(e) Agency consultation and public involvement. The Secretary and the Commission shall exercise their responsibilities pursuant to sections 544 to 544p of this title in consultation with Federal, State, and local governments having jurisdiction within the scenic area or expertise pertaining to its administration and with Indian tribes. The Secretary and the Commission shall conduct public hearings and solicit public comment prior to final adoption of the management plan and the Commission shall conduct public hearings and solicit public comment prior to final adoption of land use ordinances. The Commission and the appropriate county shall promptly notify the Secretary, the States, local governments and Indian tribes of all proposed major development actions and residential development in the scenic area.

(f) Concurrence of management plan
(1) Review by Secretary. Upon adoption of the management plan, the Commission shall promptly submit the plan to the Secretary for review. If the Secretary agrees with the Commission that the management plan is consistent with the standards established in this section and the purposes of sections 544 to 544p of this title, the Secretary shall concur to that effect. Should the Secretary fail to act on the proposed plan within ninety days, the Secretary shall be deemed to have concurred on the management plan.
(2) Denial of concurrence. If concurrence is denied, the Secretary shall state the reasons for finding the plan is inconsistent with the standards established in this section or the purposes of sections 544 to 544p of this title, and shall submit to the Commission suggested modifications to the management plan to make it consistent with such standards and the purposes of sections 544 to 544p of this title.
(3) Commission reconsideration. Within one hundred and twenty days after receipt of notification of non-concurrence, the Commission shall -
(A) revise and resubmit the plan to the Secretary; or
(B) by a vote of two-thirds of its membership, including a majority of the members appointed from each State, reject the suggested modifications of the Secretary and adopt a management plan consistent with the provisions of this section and the purposes of sections 544 to 544p of this title.

(g) Revision of plan. No sooner than five years after adoption of the management plan, but at least every ten years, the Commission shall review the management plan to determine whether it should be revised. The Commission shall submit any revised management plan to the Secretary for review and concurrence, in accordance with the provisions of this section for adoption of the management plan.

(h) Amendment of plan. If the Commission determines at any time that conditions within the scenic area have significantly changed, it may amend the management plan. The Commission shall submit amendments to the management plan to the Secretary for review, in accordance with the provisions of this section for adoption of the management plan.

(Pub. L. 99-663, Sec. 6, Nov. 17, 1986, 100 Stat. 4279.)

§ 544e Sec. 7. Administration of scenic area

(a) Management of scenic area. The non-Federal lands within the scenic area shall be administered by the Commission in accordance with the management plan and sections 544 to 544p of this title.

(b) Adoption of scenic area land use ordinances

(1) Within sixty days of initial receipt of the management plan, each county shall submit to the Commission a letter stating that it proposes to adopt a land use ordinance consistent with the management plan. If any county fails to submit such letter or fails to adopt a land use ordinance as provided in this section, the Commission shall carry out the requirements of subsection (c) of this section.

(2) Within two hundred and seventy days of receipt of the management plan, each county shall adopt a land use ordinance consistent with the management plan, and thereafter may adopt an amendment, revision or variance to a land use ordinance at any time. Each county upon adoption of a land use ordinance shall promptly submit the ordinance to the Commission.

(3) Approval by commission.

(A) Within ninety days after receipt of a land use ordinance, the Commission, by majority vote including at least three members from each State, shall approve the ordinance unless it determines the ordinance is inconsistent with the management plan. Should the Commission fail to act within ninety days, the ordinance shall be deemed to be approved.

(B) If approval is denied, the Commission shall state the reasons for finding the ordinance is inconsistent with the management plan, and shall submit to the county suggested modifications to the ordinance to make it consistent with the management plan.

(C) Each county shall have ninety days after it receives recommendations from the Commission to make modifications designed to eliminate the inconsistencies and to resubmit the ordinance to the Commission for approval. The Commission shall have sixty days to approve or disapprove the resubmitted ordinance. Any resubmitted ordinance shall become effective upon approval. Should the Commission disapprove the resubmitted ordinance, it shall promptly resubmit the ordinance for reconsideration. Should the Commission fail to act within sixty days, the ordinance shall be deemed to be approved.

(c) Commission land use ordinances

(1) Within ninety days after making a determination that a county has failed to comply with the provisions of this section, the Commission shall make and publish a land use ordinance setting standard for the use of non-Federal lands in such county within the boundaries of the national scenic area, excluding urban areas identified in section 544b(e) of this title. The ordinance shall have the object of assuring that the use of such non-Federal lands is consistent with the management plan. The ordinance may differ amongst the several parcels of land within the boundaries of the scenic area. The ordinance may from time to time be amended by the Commission.

(2) Subsequent Compliance. – In the event the Commission has promulgated regulations pursuant to this section, a county may thereafter upon written notice to the Commission elect to adopt a land use ordinance, in which event it shall comply with the provisions of this section for adoption of a land use ordinance. Upon approval of a land use ordinance by the Commission it shall supersede any regulations for the county developed by the Commission, subject to valid existing rights.

(d) Construction of facilities. The Secretary is hereby authorized to design, construct, operate and maintain such facilities as are included in the recreation assessment.
(Pub. L. 99-663, Sec. 7, Nov. 17, 1986, 100 Stat. 4282.)

§ 544f Sec. 8. Administration of special management areas

(a) Administration of Federal lands

(1)[3] The Secretary shall administer Federal lands within the special management areas in accordance with sections 544 to 544p of this title and other laws, rules and regulations applicable to the national forest system. In addition, the construction of roads and the management, utilization and harvest of timber on Federal lands within the special management areas also shall be subject to Forest Service visual resource management guidelines. The Secretary shall utilize lands acquired through exchange in calculating the allowable sales quantity on the Gifford Pinchot and Mount Hood National Forests.

(b) Withdrawal of Federal lands. Subject to valid existing rights, all Federal lands located in the special management areas are hereby withdrawn from all forms of entry, appropriation, or disposal under the public land laws, from location, entry, and patent under the mining laws of the United States, and from disposition under all laws pertaining to mineral and geothermal leasing: Provided, That the Secretary may allow the exploration, development, or production of sand, gravel, and crushed rock as necessary to construct, maintain, or reconstruct roads in the special management areas.

(c) Resource inventory. The Secretary shall complete a resource inventory for the special management areas consistent with the process and substance of the inventory prescribed by section 544d(a)(1) of this title.

(d) Recreation assessment. Within two years after November 17, 1986, the Secretary shall complete an assessment of recreation resources in the special management areas and opportunities for enhancement of these resources. The recreation assessment shall –

(1) identify areas within the special management areas suitable for designation by the Commission pursuant to section 544d of this title for the construction of an interpretive center or other appropriate facility, to be located in the State of Oregon, and of a conference center or other appropriate facility, to be located in the State of Washington;

(2) identify areas within the special management areas suitable for other public use facilities, including but not limited to educational and interpretive facilities, campsites, picnic areas, boat launch facilities, and river access areas; and

(3) subject to the treaty or other rights of Indian tribes, identify areas with the special management areas suitable for use to increase access for recreation purposes to the Columbia River and its tributaries.

(e) Land use designations. Within three years after November 17, 1986, the Secretary shall develop land use designations for the special management areas. The land use designations shall be -(1) based on the resource inventory prepared by the Secretary pursuant to this section; and (2) consistent with the standards established in section 544d of this title.

(f) Guidelines for land use ordinances

(1)[4] Within three years after November 17, 1986, the Secretary shall, in consultation with the Commission, develop guidelines to assure that non-Federal lands within the special management areas are managed consistent with the standards in section 544d of this title and the purposes of sections 544

[3] So in original. No par. (2) has been enacted.
[4] So in original. No par. (2) has been enacted.

to 544p of this title. The Secretary shall promptly transmit the guidelines to the Commission for inclusion in the management plan. The guidelines shall require that management, utilization, and disposal of timber, and exploration, development, and production of sand, gravel, and crushed rock for the construction, maintenance, or reconstruction of roads used to manage or harvest forest products on non-Federal lands within the special management areas take place without adversely affecting the scenic, cultural, recreation, and natural resources of the scenic area.

(h)[5] Adoption of special management area land use ordinances

(1) Within sixty days of receipt of the management plan, each county shall submit to the Commission a letter stating that it proposes to adopt a land use ordinance consistent with the management plan. If any county fails to submit a letter as provided in this subsection, or fails to adopt a land use ordinance as provided in this section, the Commission shall carry out the requirements of subsection (l) of this section.

(2) Within two hundred seventy days of receipt of the management plan, each county shall adopt a special management area land use ordinance consistent with the management plan, and thereafter may adopt an amendment, revision or variance to a land use ordinance at any time. Each county upon adoption of a special management area land use ordinance shall promptly submit the adopted ordinance to the Commission.

(i) Review by Commission

(1) The Commission shall review the special management area land use ordinance received from each county, and within ninety days after receipt shall make a tentative determination as to whether the ordinance is consistent with the management plan. If the Commission makes a tentative determination that the land use ordinance is consistent with the management plan, the Commission shall send the ordinance to the Secretary for concurrence.

(2) If the Commission makes a tentative determination that the land use ordinance is inconsistent with the management plan, the Commission shall state the reasons for the determination and shall return the ordinance to the appropriate county with suggested modifications required for consistency with the management plan.

(3) Each county shall have ninety days after it is notified by the Commission to make modifications designed to eliminate the inconsistencies and to resubmit the ordinance to the Commission for tentative determination of consistency. The Commission shall have sixty days to make a tentative consistency determination on the resubmitted ordinance. If found consistent, the land use ordinance shall be transmitted by the Commission to the Secretary for concurrence that the ordinance is consistent with the management plan. If the Commission finds the resubmitted ordinance inconsistent, the Commission shall adopt an ordinance pursuant to subsection (l) of this section.

(j) Concurrence by Secretary

(1) Upon receipt of a special management area land use ordinance from the Commission, the Secretary shall notify the public of such receipt and shall, within ninety days thereafter, concur with the Commission's tentative determination of consistency with the management plan unless the Secretary determines the ordinance is inconsistent. Any ordinance submitted to the Secretary shall become effective upon notification of concurrence. Should the Secretary fail to act within ninety days, the Secretary shall be deemed to have concurred with the Commission's tentative consistency determination.

[5] So in original. No subsec. (g) has been enacted.

(2) Denial of Concurrence. - If concurrence is denied, the Secretary shall state the reasons therefor and shall submit to the Commission suggested modifications to the land use ordinances to make them consistent with the management plan and the purposes of sections 544 to 544p of this title.

(k) Commission reconsideration. Upon receipt of notification of nonconcurrence by the Secretary, the Commission shall resubmit the land use ordinance to the appropriate county. Such county shall within ninety days, reconsider and revise the ordinance and resubmit the ordinance to the Commission for reconsideration in accordance with the provisions of this section. Should the Secretary again deny concurrence, the Commission shall either prepare a land use ordinance for such county pursuant to subsection (l) of this section or, by a two-thirds vote of the membership of the Commission including a majority of the members appointed from each State, determine that the ordinance is consistent with the management plan.

(l) Commission ordinances

(1) Within ninety days after making a determination that a county has failed to comply with the provisions of subsection (h) of this section, the Commission shall make and publish an ordinance setting standards for the use of non-Federal lands of such county within the boundaries of the special management areas. The ordinances shall have the object of assuring that the use of such lands is consistent with the management plan. The ordinances may differ amongst the several parcels of land within the boundaries of the special management areas. The ordinances may from time to time be amended by the Commission.

(2) The Commission shall promptly submit the ordinance to the Secretary. The Secretary shall, within ninety days after receipt of the ordinance from the Commission, concur with the tentative determination that the land use ordinance is consistent with the management plan unless a determination of inconsistency is made Any ordinance submitted to the Secretary shall become effective upon concurrence. Should the Secretary fail to concur within ninety days, the land use ordinance shall be effective.

(3) If concurrence is denied, the Secretary shall state the reasons for finding the ordinance is inconsistent with the management plan, and shall submit to the Commission suggested modifications to the ordinance to make it consistent with the plan.

(4) The Commission shall have ninety days after it receives recommendations from the Secretary to make modifications designed to eliminate the inconsistencies and to resubmit the ordinance to the Secretary for concurrence. The Secretary shall have sixty days to concur with the resubmitted ordinance. Any resubmitted ordinance shall become effective upon concurrence by the Secretary. Should the Secretary deny concurrence for the resubmitted ordinance, the Secretary shall state the reasons therefor and shall promptly resubmit the ordinance for reconsideration. Should the Secretary fail to concur within sixty days, the ordinance shall be deemed effective.

(5) Within one hundred twenty days after receipt of notification of non-concurrence, the Commission shall –

(A) revise and resubmit the land use ordinance to the Secretary; or

(B) by a vote of two-thirds of its membership, including a majority of the members appointed from each State, reject the suggested modifications of the Secretary and adopt a land use ordinance consistent with the provisions of this section and the purposes of sections 544 to 544p of this title.

(m) Subsequent compliance. In the event the Commission has adopted an ordinance pursuant to this section, the affected county may thereafter, upon written notice to the Commission and to the Secretary, elect to adopt a special management area land use ordinance, in which event it shall comply with the provisions of this section for adoption of special management area land use ordinances. Upon concurrence of such land use ordinances by the Secretary they shall supersede any special management area land use ordinances for the county development by the Commission, subject to valid existing rights.

(n) Effect of Secretary's non-concurrence. If the Secretary does not concur in any land use ordinance approved or adopted by the Commission pursuant to this section, the availability of certain funds to the relevant county shall be governed by section 544n(c) of this title.

(o) Special rules

(1) In general – Any ordinance adopted pursuant to this section shall not apply to any parcel or parcels of land within a special management area if, after the date such ordinance has been adopted, three years have elapsed after a landowner has made a bona fide offer to sell at fair market value or otherwise convey such parcel or parcels to the Secretary, unless the affected landowner agrees to an extension of the three year period: Provided, That an offer shall not be considered bona fide if the landowner refuses consideration equal to the fair market value as appraised in accordance with section 544g(e) of this title. Lands for which an ordinance is suspended pursuant to this subsection shall be subject to the relevant scenic area land use ordinance adopted pursuant to section 544e of this title.

(2) Applicability – This subsection shall not apply to any land offered to the Secretary for acquisition after March 31, 2001.

(Pub. L. 99-663, Sec. 8, Nov. 17, 1986, 100 Stat. 4283; Pub. L. 06-291, title III, Sec. 346(b), Oct. 11, 2000, 114 Stat. 999.)

§ 544g Sec. 9. Land acquisition

(a) Acquisition authorized

(1) The Secretary is authorized to acquire any lands or interests therein within the special management areas and the Dodson/Warrendale Special Purchase Unit which the Secretary determines are needed to achieve the purposes of sections 544 to 544p of this title: Provided, That any lands, waters, or interests therein owned by either State or any political subdivision thereof may be acquired only by donation or exchange.

(2) Lands within the State of Oregon acquired by the Secretary pursuant to sections 544 to 544p of this title shall become part of the Mount Hood National Forest. Lands within the State of Washington acquired by the Secretary pursuant to this section shall become part of the Gifford Pinchot National Forest. All lands acquired by the Secretary pursuant to sections 544 to 544p of this title shall be subject to the laws and regulations pertaining to the National Forest System and sections 544 to 544p of this title.

(b) Limitations on eminent domain

(1) Where authorized in subsection (a) of this section to acquire land or interests therein without the consent of the owner, the Secretary shall –

(A) acquire only such land or interests therein as is reasonably necessary to accomplish the purposes of sections 544 to 544p of this title; and

(B) do so only in cases where all reasonable efforts to acquire with the consent of the owner such lands, or interests therein, have failed.

(2) Notwithstanding the provisions of subsection (a) of this section, the Secretary may not acquire without the consent of the owner lands or interests therein which –

(A) on November 17, 1986, were used primarily for educational, religious, or charitable purposes, single-family residential purposes, farming, or grazing so long as the existing character of that use is not substantially changed or permitted for change;

(B) are located in counties with land use ordinances in which the Secretary has concurred pursuant to section 544f of this title, unless such lands are being used, or are in imminent danger of being used, in a manner incompatible with such ordinances;

(C) are within the boundaries of the Dodson/Warrendale Special Purchase Unit; or

(D) are owned by an Indian tribe, held in trust by the United States for an Indian tribe or member of an Indian tribe, or otherwise administered by the United States for the benefit of an Indian tribe or member of an Indian tribe.

(c) Hardship cases. In exercising authority to acquire lands pursuant to this section the Secretary shall give prompt and careful consideration to any offer made by any person or entity owning any land, or interest in land, within the boundaries of a special management area. In considering such offer, the Secretary shall take into consideration any hardship to the owner which might result from any undue delay in acquiring the property.

(d) Land exchanges

(1) The Secretary is authorized and directed, in conformance with the provisions of this subsection, to acquire by exchange any parcel of unimproved forest land at least forty acres in size within the boundaries of the special management areas which is owned by any private forest land owner if, after November 17, 1986, but within one hundred and eighty days after final adoption of the management plan, such private forest land owner offers to the United States such parcel of forest land.

(2) In exercising this authority to acquire forest lands pursuant to this subsection, the Secretary may accept title to such lands and convey to the owner federally owned lands deemed appropriate by the Secretary within the States of Oregon and Washington, regardless of the State in which the transferred lands are located. Forest lands exchanged pursuant to this subsection shall be of approximately equal value: Provided, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize minor differences in the values of the properties exchanged: Provided further, That the Secretary may reserve in any conveyance pursuant to this subsection such easements, subsurface rights, and any other interests in land deemed necessary or desirable: Provided further, That the valuation of lands exchanged shall be determined in terms of forest uses for timber.

(3) It is the intention of Congress that land exchanges pursuant to this subsection shall be completed no later than five years after November 17, 1986.

(4) In the event that exchanges authorized by this section leave any private forest land owner with ownership of an uneconomic remnant of forest land contiguous to a special management area, the Secretary is authorized to acquire such forest lands as if they were within the boundaries of a special management area.

(5) The following-described Federal lands and interests therein are hereby identified as candidate lands for exchanges conducted pursuant to this section: Provided, That the determination of which candidate lands will be exchanged, and in what sequence, shall be at the discretion of the Secretary. Subject to valid existing rights, such lands are hereby withdrawn from all forms of entry or

appropriation or disposal under the public land laws, and from location, entry, and patent under the United States mining law, and from disposition under all laws pertaining to mineral and geothermal leasing and all amendments thereto until the Secretary determines such lands are no longer needed to complete exchanges authorized by this section: Provided, That such period shall not extend beyond five years:

GIFFORD PINCHOT NATIONAL FOREST

Wind River-Panther Creek Area

Section	Township	Range
35	4N	7E
36	4N	7E

Approx. 430 acres.

South Swift Area

Section	Township	Range
13	6N	5E
23	6N	5E
17	6N	6E
18	6N	6E

Approx. 1,920 acres.

Buck Creek-Willard Area

Section	Township	Range
16	3N	9E
1	4N	9E
2	4N	9E
3	4N	9E
10	4N	9E
11	4N	9E
12	4N	9E
15	4N	9E
21	4N	9E
22	4N	9E
26	4N	9E
27	4N	9E
28	4N	9E
29	4N	9E
30	4N	9E
31	4N	9E
32	4N	9E
33	4N	9E

34	4N	9E
35	4N	9E
6	4N	10E
7	4N	10E
5	5N	10E
6	5N	10E
7	5N	10E
8	5N	10E
9	5N	10E
30	5N	10E
31	5N	10E
32	5N	10E

Approx. 14,460 acres.

National Area

Section	Township	Range
6	14N	7E
7	14N	7E
18	14N	7E
30	14N	7E

Approx. 2,560 acres.

SIUSLAW NATIONAL FOREST

East Beaver Area

Section	Township	Range
33	2S	9W
34	2S	9W
2	3S	9W
3	3S	9W
4	3S	9W
8	3S	9W
9	3S	9W
17	3S	9W

Approx. 3,053 acres.

WILLAMETTE NATIONAL FOREST

Ida-McCoy Area

Section	Township	Range
21	10S	6E
28	10S	6E

Approx. 680 acres.

MOUNT HOOD NATIONAL FOREST

Estacada Area

Section	Township	Range
15	10S	5E

Approx. 560 acres.

Zig-Zag Area

Section	Township	Range
22	2S	7E
29	2S	7E

Approx. 280 acres.

Hood River Area

Section	Township	Range
4	1N	9E
36	1N	10E
31	1N	11E
2	1S	9E
3	1S	9E
4	1S	9E
5	1S	9E
6	1S	9E

Approx. 5,800 acres.

(e) Appraisals

(1) Definition of landowner – In this subsection, the term "landowner" means the owner of legal or equitable title as of September 1, 2000.

(2) Appraisal standards – Except as provided in paragraph (3), land acquired or conveyed by purchase or exchange under this section shall be appraised in conformity with the Uniform Appraisal Standards for Federal Land Acquisitions.

(3) Special management areas

(A) Before April 1, 2001 – Land within a special management area for which the landowner, before April 1, 2001, makes a written bona fide offer to convey to the Secretary for fair market value shall be appraised –
(i) without regard to the effect of any zoning or land use restriction made in response to sections 544 to 544p of this title; but
(ii) subject to any other current zoning or land use restriction imposed by the State or locality in which the land is located on the date of the offer.

(B) On or after April 1, 2001 – Land within a special management area for which the landowner, on or after April 1, 2001, makes a written bona fide offer to convey to the Secretary for fair market value shall be appraised subject to –
(i) any zoning or land use restriction made in response to sections 544 to 544p of this title; and
(ii) any other current zoning or land use restriction that applies to the land on the date of the offer.

(f) Authorization for certain land exchanges
(1) In general. To facilitate priority land exchanges through which land within the boundaries of the White Salmon Wild and Scenic River or within the scenic area is conveyed to the United States, the Secretary may accept title to such land as the Secretary determines to be appropriate within the States, regardless of the State in which the land conveyed by the Secretary in exchange is located, in accordance with land exchange authorities available to the Secretary under applicable law.
(2) Special rule for land certain exchanges. Notwithstanding any other provision of law –
(A) any exchange described in paragraph (1) for which an agreement to initiate has been executed as of September 30, 2000, shall continue; and
(B) any timber stumpage proceeds collected under the exchange shall be retained by the Forest Service to complete the exchange.

(g) Boundaries. For the purposes of section 460l-9 of this title, the boundaries of the scenic area, including special management areas and the Dodson/Warrendale Special Purchase Unit shall be treated as if they were within the boundaries of the Mount Hood or Gifford Pinchot National Forests as of January 1, 1965.

(Pub. L. 99-663, Sec. 9, Nov. 17, 1986, 100 Stat. 4287; Pub. L. 104-66, title I, Sec. 1011(n), Dec. 21, 1995, 109 Stat. 710; Pub. L. 106-291, title III, Sec. 346(a), Oct. 11, 2000, 114 Stat. 999.)

§ 544h Sec. 10. Interim management

(a) Interim guidelines
(1)[6] Within one hundred eighty days after November 17, 1986, the Secretary shall develop interim guidelines for the scenic area outside urban areas to identify land use activities which are inconsistent with sections 544 to 544p of this title and to govern the authority to acquire land without the consent of the owner provided by subsection (b) of this section. The Secretary shall promptly notify the public of adoption of the interim guidelines and transmit the guidelines to each county. Guidelines adopted by the Secretary pursuant to this subsection shall remain in effect for each county until the Secretary has developed guidelines for the special management areas pursuant to section 544f of this title and the land use ordinances prescribed by section 544e of this title are in effect.

[6] So in original. No par. (2) has been enacted.

(b) Interim acquisition authority and injunctive relief. Prior to the concurrence by the Secretary of land use ordinances prescribed by section 544f of this title and the approval by the Commission of land use ordinances prescribed by section 544e of this title, the following authorities are granted:

(1) The Secretary may acquire by condemnation any land or interest which is being used or threatened to be used in a manner inconsistent with the purposes for which the scenic area was established and which will cause or is likely to cause impacts adversely affecting the scenic, cultural, recreation, and natural resources of the scenic area: Provided, That no lands or interests therein can be acquired by condemnation pursuant to this section if used in the same manner and for the same purposes as used on November 17, 1986, unless such land is used for or interest is in the development of sand, gravel, or crushed rock, or the disposal of refuse: Provided further, That within thirty days of the filing by the Secretary of a complaint for condemnation of any land or interest in the scenic area, outside of the special management areas and urban areas, the Commission, by a vote of two-thirds of its membership including a majority of the members appointed from each State, or if the Commission is not in existence the Governor of the State in which the land or interest is located, may disapprove such proposed complaint.

(2) Upon or after the commencement of any action for condemnation pursuant to this subsection, the Secretary, acting through the Attorney General of the United States, may apply to the appropriate United States District Court for a temporary restraining order or injunction to prohibit the use of any property within the scenic area, but outside of urban areas, which will cause or is likely to cause impacts adversely affecting the scenic, cultural, recreation and natural resources of the scenic area or is otherwise inconsistent with the purposes for which the scenic area was established. During the period of such order or injunction, the Secretary shall diligently and in good faith negotiate with the owner of the property to assure that, following termination of the order or injunction, the inconsistent use is abated or the adverse effect is mitigated.

(c) Review of development action. Prior to the effective date of a land use ordinance for each county pursuant to section 544e of this title, and concurrence of the Secretary on a land use ordinance for each county pursuant to section 544f of this title, the Commission shall review all proposals for major development actions and new residential development in such county in the scenic area, except urban areas. The Commission shall allow major development actions and new residential development only if it determines that such development is consistent with the standards contained in section 544d of this title and the purposes of sections 544 to 544p of this title.

(Pub. L. 99-663, Sec. 10, Nov. 17, 1986, 100 Stat. 4291.)

§ 544i Sec. 11. Economic development

(a) Economic development plan. Based on the Economic Opportunity Study and other appropriate information, each State, in consultation with the counties and the Commission, shall develop a plan for economic development projects for which grants under this section may be used in a manner consistent with sections 544 to 544p of this title.

(b) Funds provided to States for grants. Upon certification of the management plan, and receipt of a plan referred to in subsection (a) of this section, the Secretary shall provide $5,000,000 to each State which each State shall use to make grants and loans for economic development projects that further the purposes of sections 544 to 544p of this title.

(c) Conditions of grants. Each State making grants under this section shall require as a condition of a grant that –
  (1) all activities undertaken under the grant are certified by the Commission as being consistent with the purposes of sections 544 to 544p of this title, the management plan, and land use ordinances adopted pursuant to sections 544 to 544p of this title;
  (2) grants and loans are not used to relocate a business from one community to another;
  (3) grants and loans are not used for program administration; and
  (4) grants and loans are used only in counties which have in effect land use ordinances found consistent by the Commission and concurred on by the Secretary pursuant to section 544f of this title.

(d) Report. Each State shall –
  (1) prepare and provide the Secretary with an annual report to the Secretary on the use of the funds made available under this section;
  (2) make available to the Secretary and to the Commission, upon request, all accounts, financial records, and other information related to grants and loans made available pursuant to this section; and
  (3) as loans are repaid, make additional grants and loans with the money made available for obligation by such repayments.

(Pub. L. 99-663, Sec. 11, Nov. 17, 1986, 100 Stat. 4292.)

§ 544j Sec. 12. Old Columbia River Highway

The Oregon Department of Transportation shall, in consultation with the Secretary and the Commission, the State of Oregon and the counties and cities in which the Old Columbia River Highway is located, prepare a program and undertake efforts to preserve and restore the continuity and historic integrity of the remaining segments of the Old Columbia River Highway for public use as a Historic Road, including recreation trails to connect intact and usable segments.

(Pub. L. 99-663, Sec. 12, Nov. 17, 1986, 100 Stat. 4293.)

§ 544k Sec. 13. Tributary rivers and streams

(a) Water resources projects. The following rivers and streams shall be subject to the same restrictions on the licensing, permitting, and exempting from licensing and the construction of water resource projects as provided for components of the National Wild and Scenic Rivers System pursuant to section 7(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1278(a)):
  (1) any tributary river or stream to the Columbia River not designated in subsections[7] (c) or (d) of this section or otherwise specified in this subsection which flows in whole or in part through a special management area, unless the construction of a water resources project would not have a direct and adverse effect on the scenic, cultural, recreation, and natural resources of the scenic area;
  (2) any river or river segment which flows in whole or in part through the scenic area and which is established pursuant to State law as a wild, scenic, or recreation river or which is under study pursuant to State law for the potential inclusion in any such State protected river system, unless such project or projects meet terms and conditions set by State agencies exercising administration over such river or river segment;
  (3) the Wind River, Washington, for a period not less than three years following the later of –

[7] So in original. Probably should be "subsection".

(A) final approval of the Gifford Pinchot National Forest Plan, adopted pursuant to the National Forest Management Act of 1976 (Act of October 22, 1976, Public Law 94-588, as amended) (16 U.S.C. 1600 et seq.); or

(B) submittal by the Secretary of a report to the President on the suitability or nonsuitability for addition to the national wild and scenic rivers system and a report by the President to the Congress of recommendations and proposals with respect to the designation of such river under the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.);

(4) the Hood River, Oregon, for a period not to exceed twenty years from November 17, 1986, if such facility impounds or diverts water other than by means of a dam or diversion existing as of November 17, 1986; and

(5) the segment of the Little White Salmon, Washington, from the Willard National Fish Hatchery to its confluence with the Columbia River if such facility impounds or diverts water other than by means of a dam or diversion existing as of November 17, 1986.

(b) Exceptions. The provisions of subsection (a) of this section shall not apply to those portions of tributary rivers or streams to the Columbia River which flow through or border on Indian reservations. Nothing in this section shall apply to or affect any segment of any river designated as a wild and scenic river under section 3 of the Wild and Scenic Rivers Act (16 U.S.C. 1274) or any river designated for study under section 5 of such Act (16 U.S.C. 1276).

(Pub. L. 99-663, Sec. 13(a), (b), Nov. 17, 1986, 100 Stat. 4293, 4294.)

§ 544l Sec. 14. Implementation measures

(a) Assistance to counties. The Secretary shall provide technical assistance on a nonreimbursable basis to counties for the development of land use ordinances prescribed by sections 544e and 544f of this title: Provided, That in the event a county fails to obtain approval by the Commission for a land use ordinance within three years after the date technical assistance is first provided under this subsection for the development of a land use ordinance, the Secretary shall terminate all technical assistance for any participation in the development of such ordinance.

(b) Payment of timber receipts

(1) Notwithstanding the provisions of section 500 of this title, that portion of which is paid under such provisions to the State of Oregon with respect to the special management areas within the Mount Hood National Forest, the Gates of the Columbia Gorge Special Management Area, Mount Hood National Forest, and to the State of Washington with respect to the special management areas within the Gifford Pinchot National Forest –

(A) not less than 50 per centum shall be expended for the benefit of the public schools of the county which has adopted implementation measures pursuant to sections 544 to 544p of this title; and

(B) the remainder shall be expended for the benefit of public roads or any public purposes of any county which has adopted implementation measures pursuant to sections 544 to 544p of this title.

(2) Paragraph (1) of this subsection shall not apply –

(A) to any amount paid by the Secretary of the Treasury under the provisions of law referred to in subsection (b)(1) of this section at the end of any fiscal year ending before November 17, 1986; or

(B) for a particular county, if the county does not have in effect a land use ordinance which has been found consistent by the Commission and concurred on by the Secretary pursuant to section 544f of this title.

(c) Payments to local governments

(1) Subject to section 544n(b) of this title, in the case of any land or interest therein acquired by the Secretary pursuant to section 544g of this title, which was subject to local real property taxes within the five years preceding such acquisition and which is located in a county which has in effect a land use ordinance which has been found consistent by the Commission and concurred on by the Secretary pursuant to section 544f of this title, the Secretary is authorized and directed to make annual payments to the county in which such lands are located in an amount equal to 1 per centum of the fair market value of such land or interest therein on the date of acquisition by the Secretary.

(2) Notwithstanding paragraph (1) of this subsection, any payment made for any fiscal year to a county pursuant to this subsection shall not exceed the amount of real property taxes assessed and levied on such property during the last full fiscal year before the fiscal year in which such land or interest therein was acquired by the Secretary.

(3) Limitation.

(A) In general. - Except as provided in subparagraph (B), no payment shall be made under this subsection with respect to any land or interest therein after the eighth full fiscal year beginning after the first fiscal year in which such a payment was made with respect to such land or interest therein.

(B) Continuation of certain payments. - For any land or interest in land for which the Secretary is making a payment in fiscal year 2000, such payment shall be continued for a total of eight fiscal years.

(d) Federal consistency. Except as otherwise provided in subsection (e) of this section or in section 544o of this title, Federal agencies having responsibilities within the scenic area shall exercise such responsibilities consistent with the provisions of sections 544 to 544p of this title as determined by the Secretary.

(e) Limitations on Federal expenditures affecting the scenic area

(1) Except as provided in paragraph (3), if the Commission has not been established pursuant to section 544c of this title within fifteen months after November 17, 1986, or is otherwise disestablished for any reason, no new expenditures or new financial assistance may be made available, and no new license or new permit, or exemption from a license or permit requirement, shall be issued, under authority of any Federal law for any activity within the scenic area, excluding urban areas, which the Secretary,[8] determines is inconsistent with any implementation measure pursuant to, the standards established in section 544d(b) of this title, or the purposes of sections 544 to 544p of this title.

(2) (A) (i) An expenditure or financial assistance made available under authority of Federal law shall be treated, for purposes of this subsection, as a new expenditure or new financial assistance if –

(I) in any case with respect to which specific appropriations are required, no money for construction or purchase was appropriated before October 1, 1986; or

(II) no legally binding commitment for the expenditure or financial assistance was made before October 1, 1986.

(ii) Payments made to the State pursuant to the following Acts shall not be treated as an expenditure or financial assistance for purposes of this subsection: section 500 of this title; the Mineral Lands Leasing Act of 1920 (30 U.S.C. 181 et seq.); chapter 69 of title 31 (relating to payments in lieu of taxes for entitlement land); the Act of June 9, 1916 (39 Stat. 218), and the Act of Feb. 26, 1919 (40 Stat. 1179).

[8] So in original. The comma probably should not appear.

(B) A license or permit, or exemption from a license or permit requirement, shall be treated, for purposes of this subsection, as a new license or new permit, or exemption from a license or permit requirement, if such license or permit, or exemption from a license or permit requirement, was issued on or after October 1, 1986. A renewal under similar terms and conditions of a license or permit, or exemption from a license or permit requirement, issued before October 1, 1986, shall not be treated as a new license or new permit, or exemption from a license or permit requirement.

(3) Notwithstanding paragraph (1), the appropriate Federal officer, after consultation with the Secretary, may make Federal expenditures or financial assistance available within the area for any of the following:

(A) The maintenance of existing channel improvements and related structures, and including the disposal of dredge materials related to such improvements.

(B) The maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or publicly operated roads, structures, or facilities that are essential links in a larger network or system.

(C) Military activities essential to national security.

(D) Any of the following actions or projects, but only if the making available of expenditures or assistance therefor is consistent with the standards in section 544d(b) of this title and the purposes of sections 544 to 544p of this title:

(i) Projects for the study, management, protection and enhancement of fish and wildlife resources and habitats, including, but not limited to, acquisition of fish and wildlife habitats and related lands, stabilization projects for fish and wildlife habitats, and recreational projects.

(ii) The establishment, operation, and maintenance of air and water navigation aids and devices, and for access thereto.

(iii) Projects under the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460l-4 through 11) and the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.).

(iv) Scientific research, including but not limited to aeronautical, atmospheric, space, geologic, marine, fish and wildlife, and other research, development, and applications.

(v) Assistance for emergency actions essential to the saving of lives and the protection of property and the public health and safety, if such actions are performed pursuant to sections 305 and 306 of the Disaster Relief Act of 1974 (42 U.S.C. 5145 and 5146) and section 1362 of the National Flood Insurance Act of 1968 (42 U.S.C. 4103) and are limited to actions that are necessary to alleviate the emergency.

(vi) The maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or publicly operated roads, structures, or facilities. This clause shall not apply to roads, structures, or facilities referred to in paragraph (3)(B).

(vii) Nonstructural projects for shoreline stabilization that are designed to mimic, enhance, or restore natural stabilization systems.

(4) The Director of the Office of Management and Budget shall, on behalf of each Federal agency concerned, make written certification that each such agency has complied with the provisions of this subsection during each fiscal year beginning after September 30, 1987. Such certification shall be submitted on

an annual basis to the House of Representatives and the Senate pursuant to the schedule required under the Congressional Budget and Impoundment Control Act of 1974.

(5) Nothing contained in this subsection shall be construed as indicating an intent on the part of the Congress to change the existing relationship of other Federal laws to the law of a State, or a political subdivision of a State, or to relieve any person or any obligation imposed by any law of any State, or political subdivision of a State. No provision of this subsection shall be construed to invalidate any provision of State or local law unless there is a direct conflict between such provision and the law of the State, or political subdivision of the State, so that the two cannot be reconciled or consistently stand together. This subsection shall in no way be interpreted to interfere with a State's right to protect, rehabilitate, preserve, and restore lands within its established boundary.

(f) Transfer of public lands. Subject to valid existing rights, all public lands within the scenic area administered by the Secretary of the Interior through the Bureau of Land Management are hereby transferred without consideration to the jurisdiction of the Secretary to be managed as National Forest lands in accordance with the provisions of sections 544 to 544p of this title.

(Pub. L. 99-663, Sec. 14, Nov. 17, 1986, 100 Stat. 4294; Pub. L. 106-291, title III, Sec. 346(e), Oct. 11, 2000, 114 Stat. 1000.)

§ 544m Sec. 15. Enforcement

(a) Administrative remedies

(1) Commission orders. The Commission shall monitor activities of counties pursuant to sections 544 to 544p of this title and shall take such actions as it determines are necessary to ensure compliance.

(2) Appeal to the Commission. Any person or entity adversely affected by any final action or order of a county relating to the implementation of sections 544 to 544p of this title may appeal such action or order to the Commission by filing with the Commission within thirty days of such action or order, a written petition requesting that such action or order be modified, terminated, or set aside.

(3) Civil penalties. Any person or entity who willfully violates the management plan or any land use ordinance or any implementation measure or any order issued by the Commission pursuant to sections 544 to 544p of this title may be assessed a civil penalty by the Commission not to exceed $10,000 for each violation. No penalty may be assessed under this subsection unless such person or entity is given notice and opportunity for a public hearing with respect to such violation. The Commission may compromise, modify, or remit,with or without conditions, any penalty imposed under this subsection, taking into consideration the nature and seriousness of the violation and the efforts of the violator to remedy the violation in a timely manner.

(b) Judicial remedies

(1) Civil actions to enforce sections 544 to 544p of this title

(A) Except as otherwise limited by sections 544 to 544p of this title, the Attorney General of the United States may, at the request of the Secretary, institute a civil action for an injunction or other appropriate order to prevent any person or entity from utilizing lands within the special management areas in violation of the provisions of sections 544 to 544p of this title, interim guideline adopted or other action taken by the Secretary pursuant to sections 544 to 544p of this title.

(B) The Commission, or, at the request of the Commission, or the attorney general of Oregon or Washington, may institute a civil action for an

injunction or other appropriate order to prevent any person or entity from utilizing lands within the scenic area outside urban areas in violation of the provisions of sections 544 to 544p of this title, the management plan, or any land use ordinance or interim guideline adopted or other action taken by the Commission or any county pursuant to sections 544 to 544p of this title.

(2) Citizens suits. Any person or entity adversely affected may commence a civil action to compel compliance with sections 544 to 544p of this title -

(A) against the Secretary, the Commission or any county where there is alleged a violation of the provisions of sections 544 to 544p of this title, the management plan or any land use ordinance or interim guideline adopted or other action taken by the Secretary, the Commission, or any county pursuant to or Commission[9] under sections 544 to 544p of this title; or

(B) against the Secretary, the Commission, or any county where there is alleged a failure of the Secretary, the Commission or any county to perform any act or duty under sections 544 to 544p of this title which is not discretionary with the Secretary, the Commission or any county.

(3) Limitation on bringing of citizens suits. No action may be commenced -

(A) under paragraph (2)(A) of this subsection –

(i) prior to sixty days after the plaintiff has given notice in writing of the alleged violation to the Secretary, to the Commission, and to the county in which the violation is alleged to have occurred; or

(ii) if the Attorney General of the United States, or the attorney general of Oregon or Washington, has commenced and is diligently prosecuting a civil action on the same matter pursuant to paragraph (1) of this subsection to require compliance with the management plan or any regulations, guidelines, or standards issued or other actions taken by the Secretary, the Commission, or any county pursuant to sections 544 to 544p of this title: Provided, That in any such action any person or entity otherwise entitled to bring an action pursuant to paragraph (2) of this subsection may intervene as a matter of right; or

(iii) which challenges the consistency of the draft management plan with the purposes and standards of sections 544 to 544p of this title or with other applicable law prior to the certification or adoption of the Management Plan pursuant to section 544d of this title; or

(B) under paragraph (2)(B) of this subsection prior to sixty days after the plaintiff has given notice in writing of such action to the Secretary, the Commission, and to the county in which the failure to perform any act or duty pursuant to sections 544 to 544p of this title is alleged: Provided, That such action may be brought immediately after such notification where the violation or order complained of constitutes an imminent threat to the health or safety of the plaintiff or would immediately affect a legal interest of the plaintiff.

(4) Judicial review. Any person or entity adversely affected by –

(A) any final action or order of a county, the Commission, or the Secretary relating to the implementation of sections 544 to 544p of this title;

(B) any land use ordinance or interim guideline adopted pursuant to sections 544 to 544p of this title;

[9] So in original. The word "Commission" probably should not appear.

(C) any appeal to the Commission pursuant to this section;
(D) any civil penalty assessed by the Commission pursuant to paragraph (a)(3) of this subsection may appeal such action or order by filing in any of the courts specified in paragraph (5) of this subsection, within sixty days after the date of service of such order or within sixty days after such action is taken, a written petition requesting such action, order, land use ordinance, interim guideline, or appeal taken to the Commission be modified, terminated, or set aside.

(5) Federal court jurisdiction. The United States district courts located in the States of Oregon and Washington shall have jurisdiction over –
(A) any criminal penalty imposed pursuant to section 551 of this title, or any other applicable law for violation of any order, regulation or other action taken by the Secretary pursuant to sections 544 to 544p of this title;
(B) any civil action brought against the Secretary pursuant to this section; or
(C) any appeal of any order, regulation, or other action of the Secretary taken pursuant to paragraph (4) of this subsection.

(6) State court jurisdiction. The State courts of the States of Oregon and Washington shall have jurisdiction –
(A) to review any appeals taken to the Commission pursuant to subsection (a)(2) of this section;
(B) over any civil action brought by the Commission pursuant to subsection (b)(1) of this section or against the Commission, a State, or a county pursuant to subsection (b)(2) of this section;
(C) over any appeal of any order, regulation, or other action of the Commission or a county taken pursuant to paragraph 4 of this subsection; or
(D) any civil penalties assessed by the Commission pursuant to subsection (a)(3) of this section.

(Pub. L. 99-663, Sec. 15, Nov. 17, 1986, 100 Stat. 4297.)

§ 544n Sec. 16. Authorization of appropriations

(a) General authorizations. There are authorized to be appropriated for fiscal years after the fiscal year 1986 such sums as are described below;[10]
(1) For the purpose of acquisition of lands, water and interests therein pursuant to sections 544 to 544p of this title: $40,000,000: Provided, That of this amount no more than $10,000,000 shall be available to acquire lands, water, and interests therein pursuant to section 544h of this title. Such amounts are authorized to be appropriated from amounts covered into the Land and Water Conservation Fund notwithstanding any allocation, apportionment, or limitation contained in the Land and Water Conservation Fund (16 U.S.C. 460l-4 and following).
(2) For the purpose of providing payments to local governments pursuant to section 544l(c) of this title: $2,000,000.

(b) Specific authorizations. There are authorized to be appropriated for fiscal years after the fiscal year 1986, effective upon concurrence on the management plan pursuant to section 544d of this title:
(1) For the purpose of construction of an interpretive center to be located in the State of Oregon, and a conference center to be located in the State of Washington: $10,000,000.
(2) For the purpose of construction of recreation facilities pursuant to section 544e(d) of this title: $10,000,000.

[10] So in original. The semicolon probably should be a colon.

(3) For the purpose of preparing a program and restoring and reconstructing the Old Columbia River Scenic Highway, Oregon pursuant to section 544j of this title: $2,800,000.

(4) For the purpose of providing economic development grants pursuant to section 544i of this title: $5,000,000 for each State: Provided, That funds authorized to be appropriated pursuant to this paragraph shall be available for the acquisition of lands and interests therein pursuant to section 544h of this title if, at the expiration of three years, the States have failed to carry out their respective function pursuant to section 544c of this title.

(c) Availability of funds. Funds appropriated under subsections (a)(2) and (b) of this section shall not be made available for any county which does not have in effect a land use ordinance which has been found to be consistent by the Commission, and concurred on by the Secretary as consistent with the management plan pursuant to section 544f of this title.

(Pub. L. 99-663, Sec. 16, Nov. 17, 1986, 100 Stat. 4300.)

§ 544o Sec. 17. Savings provisions

(a) Nothing in sections 544 to 544p of this title shall –

(1) affect or modify any treaty or other rights of any Indian tribe;

(2) except as provided in section 13(c), authorize the appropriation or use of water by any Federal, State, or local agency, Indian tribe, or any other entity or individual;

(3) except as provided in section 13(c), affect the rights or jurisdictions of the United States, the States, Indian tribes or other entities over waters of any river or stream or over any ground water resource or affect or interfere with transportation activities on any such river or stream;

(4) except as provided in section 13(c), alter, establish, or affect the respective rights of the United States, the States, Indian tribes, or any person with respect to any water or water-related right;

(5) alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by the States before November 17, 1986;

(6) affect or modify the ability of the Bonneville Power Administration to operate, maintain, and modify existing transmission facilities;

(7) affect lands held in trust by the Secretary of the Interior for Indian tribes or individual members of Indian tribes or other lands acquired by the Army Corps of Engineers and administered by the Secretary of the Interior for the benefit of Indian tribes and individual members of Indian tribes;

(8) affect the laws, rules and regulations pertaining to hunting and fishing under existing State and Federal laws and Indian treaties;

(9) require any revision or amendment of any forest plan adopted pursuant to the National Forest Management Act of 1976 (Act of October 22, 1976, Public Law 94-588, as amended (16 U.S.C. 1600 et seq.)); or

(10) establish protective perimeters or buffer zones around the scenic area or each special management area. The fact that activities or uses inconsistent with the management directives for the scenic area or special management areas can be seen or heard from these areas shall not, of itself, preclude such activities or uses up to the boundaries of the scenic area or special management areas.

(b) Improvement of navigation facilities at Bonneville Dam. Except for the offsite disposal of excavation material, nothing in sections 544 to 544p of this title shall be construed to affect or modify the responsibility of the United States Army Corps of Engineers to improve navigation facilities at Bonneville Dam pursuant to Federal law.

(c) Rights and responsibilities of non-Federal timber land owners. Except for the management, utilization, or disposal of timber resources of non-Federal lands within the special management areas, nothing in sections 544 to 544p of this title shall affect the rights and responsibilities of non-Federal timber land owners under the Oregon and Washington Forest Practices Acts or any county regulations which under applicable State law supersede such Acts.

(d) Interstate compacts. Mandatory language in sections 544 to 544p of this title respecting the powers and responsibilities of the Commission shall be interpreted as conditions precedent to congressional consent to the interstate compact described in section 544c of this title.

(e) Failure to establish Columbia River Gorge Commission; responsibility of Secretary. In the event that the States of Washington and Oregon fail to comply with the provisions of section 544c of this title, the Secretary shall not be obligated to take actions which are predicated upon the establishment of the Commission.

(f) Actions of Secretary as major Federal actions affecting the environment

(1) Actions by the Secretary pursuant to subsections (f), (g), and (h) of section 544d of this title; subsections (f), (j), (k), and (l) of section 544f of this title; section 544g of this title; and subsections (a) and (b)(2) of section 544h of this title shall neither be considered major Federal actions significantly affecting the quality of the environment under section 102 of the National Environmental Policy Act (42 U.S.C. 4332) nor require the preparation of an environmental assessment in accordance with that Act (42 U.S.C. 4321 et seq.).

(2) Except as provided in paragraph (1) of this subsection, nothing in sections 544 to 544p of this title shall expand, restrict, or otherwise alter the duties of the Secretary under the National Environmental Policy Act.

(Pub. L. 99-663, Sec. 17, Nov. 17, 1986, 100 Stat. 4300.)

§ 544p Sec. 18. Severability

(a)[11] If any provision of sections 544 to 544p of this title or the application thereof to any person, State, Indian tribe, entity, or circumstance is held invalid, neither the remainder of sections 544 to 544p of this title, nor the application of any provisions herein to other persons, States, Indian tribes, entities, or circumstances, shall be affected thereby.

(Pub. L. 99-663, Sec. 18, Nov. 17, 1986, 100 Stat. 4302.)

[11] So in original. No subsec. (b) has been enacted.

Glossary

The definitions listed below apply to both General Management Area and Special Management Area, unless otherwise noted.

Accepted agricultural practice: A mode of operation that is common to farms or ranches of similar nature, necessary for the operation of such farms or ranches to obtain a profit in money and customarily utilized in conjunction with agricultural use.

Accessory structure/building: A structure or detached building whose use is incidental and subordinate to that of the main use of the property, and that is located on the same parcel as the main building or use. The term “detached” means that the main building and accessory building do not share a common wall. An accessory building connected to the main building by a breezeway is a detached building.

Active wildlife site: A wildlife site that has been used within the past 5 years by a sensitive wildlife species.

Addition: An extension or increase in the area or height of an existing building.

Agency official: The federal, state, or local agency head or designee who has authority over a proposed project.

Agricultural specialist (SMA): A person such as a county extension agent with a demonstrated knowledge of farming operations, and a demonstrated ability to interpret and recommend methods to implement regulations pertaining to agriculture. Such abilities are usually obtained through a combination of higher education and experience.

Agricultural structure/building: A structure or building located on a farm or ranch and used in the operation for the storage, repair, and maintenance of farm equipment and supplies or for the raising and/or storage of crops and livestock. These include, but are not limited to: barns, silos, workshops, equipment sheds, greenhouses, wind machines (orchards), processing facilities, storage bins and structures.

Agricultural use: The current employment of land for the primary purpose of obtaining a profit in money by raising, harvesting, and selling crops; or by the feeding,

breeding, management, and sale of, or production of, livestock, poultry, fur-bearing animals or honeybees; or for dairying and the sale of dairy products; or any other agricultural or horticultural use, including Christmas trees. Current employment of land for agricultural use includes:

1. The operation or use of farmland subject to any agriculture-related government program.

2. Land lying fallow for 1 year as a normal and regular requirement of good agricultural husbandry.

3. Land planted in orchards or other perennials prior to maturity.

4. Land under buildings supporting accepted agricultural practices.

Agricultural use does not include livestock feedlots.

Anadromous fish: Species of fish that migrate upstream to freshwater after spending part of their life in the ocean (saltwater).

Anaerobic: A condition in which molecular oxygen is absent (or effectively so) from the environment.

Aquaculture: The cultivation, maintenance, and harvesting of aquatic species.

Aquatic area: The water area of a stream, pond, or lake measured at the ordinary high water mark.

Archaeological resources: See cultural resource.

Archival research: Research in primary documents that is likely to yield information regarding human occupation of the area in question, including but not limited to deed, census, cartographic, and judicial records.

Bed and breakfast inn: An establishment located in a structure designed as a single-family dwelling where more than two rooms but fewer than six rooms are rented on a daily basis. Bed and breakfast inns are clearly incidental to the use of a structure as a single-family dwelling and are owner occupied and operated. Bed and breakfast inns operate as transient accommodations, not as rooming or boarding houses.

Best management practices: Conservation techniques and management measures that (1) control soil loss and reduce water quality degradation caused by nutrients, animal waste, toxins, and sediment; (2) minimize adverse affects to groundwater and surface-water flow and circulation patterns; and (3) maintain the chemical, biological, and physical characteristics of wetlands, ponds, streams, and riparian areas.

Biodiversity (SMA): A diversity of biological organisms at the genetic, species, ecosystem, and landscape levels.

Boat landing: Cleared area or developed structure used to facilitate launching or retrieving watercraft.

Buffer zone: An area adjacent to a wetland, stream, pond, or other sensitive area that is established and managed to protect sensitive natural resources from human disturbance. In instances that involve a wetland, stream, or pond, the buffer zone includes all or a portion of the riparian area.

Building: Any structure used or intended for supporting or sheltering any use or occupancy. Buildings have a roof supported by columns or walls. They include, but are not limited to, dwellings, garages, barns, sheds and shop buildings.

Camping or recreational vehicle: A vacation trailer, camper, self-propelled vehicle, or structure equipped with wheels for highway use that is intended for recreational purposes, but not for residential purposes, and is equipped with plumbing, sink, or toilet. A camping or recreational vehicle shall be considered a dwelling unit if it is connected to a sewer system (including septic tank), water, and electrical lines or is occupied on the same parcel for more than 60 days in any consecutive 12-month period.

Campsite: Single camping unit that usually consists of a cleared, level area for a tent, and may include a parking spur, fire ring, table, and other amenities.

Capability: The ability of land to produce forest or agricultural products due to characteristics of the land itself, such as soil, slope, exposure, or other natural factors.

Canopy closure (SMA): For forest practices, the percentage measuring the degree to which one layer of a tree canopy blocks sunlight or obscures the sky as measured from below.

Cascadian architecture (SMA): Architectural style using native rock work, large timber, and steeply pitched roofs in a rustic manner.

Catastrophic situations (SMA): Forces such as fire, insect and disease infestations, and earth movements.

Childcare center: A facility providing daycare to three or more children, but not including:

1. The provision of care that is primarily educational, unless provided to a preschool child for more than 4 hours a day.

2. The provision of care that is primarily supervised training in a specific subject, including but not limited to dancing, gymnastics, drama, music or religion.

3. The provision of short-term care related to or associated with group athletic or social activities.

4. The provision of daycare in the provider's home in the family living quarters for less than 13 children.

Columbia River Gorge National Scenic Area Graphic Signing System: Sign design standards developed for the Scenic Area for public signs in and adjacent to public road rights-of-way.

Commercial development/use: Any facility or use of land or water whose function is primarily retail buying or selling of goods or services or both. This does not include fruit or produce stands.

Commercial forest products: These include timber for lumber, pulp, and firewood for commercial purposes.

Commercial recreation: Any private (non-governmental) recreational activity or facility on privately owned land, excluding nonprofit facilities. This does not include operation of a public recreation facility by a private vendor.

Community facility: Basic utilities and services necessary to support public service needs, including but not limited to water and power utilities, sanitation facilities, public microwave stations and communication facilities, schools, roads and highways. This does not include sanitary landfills.

Consulting parties (cultural resources): Organizations or individuals who submit substantive written comments to a local government in a timely manner because they are concerned with the effects of a proposed use on cultural resources.

Contiguous land: Parcels or other lands that are under the same ownership and have a common boundary, regardless of whether or not portions of the parcels have separate tax lot numbers, lie in different counties, lie in different sections or government lots, lie in different land use or zoning designations, or are separated by public or private roads. Contiguous land does not include parcels that meet only at a single point.

Counties: The six counties within the Scenic Area: Hood River, Multnomah, and Wasco in Oregon; and Clark, Skamania, and Klickitat in Washington.

Created opening (SMA): A created forest opening with less than 40 percent average canopy closure of overstory trees and less than 60 percent average canopy closure of understory trees averaging less than 5 inches diameter at breast height

for coniferous forests and less than 25 percent total canopy cover for oak woodlands. This definition does not include agricultural fields.

Creation (wetlands): A human activity that converts an upland into a wetland. This definition presumes that the area to be converted has not been a wetland in recent times (100 to 200 years).

Cultivation: Any activity that prepares land for raising crops by turning, breaking, or loosening the soil. Cultivation includes plowing, harrowing, leveling, and tilling.

Cultural resource: Evidence of human occupation or activity that is important in the history, architecture, archaeology or culture of a community or region. Cultural resources include, but are not limited to, the following:

- Archaeological resources. Physical evidence or ruins of human occupation or activity that are located on or below the surface of the ground and are at least 50 years old.

  Archaeological resources include, but are not limited to, the remains of houses, villages, camp and fishing sites, and cave shelters; rock art such as petroglyphs and pictographs; artifacts such as arrowheads, utensils, tools, fragments of tools and utensils, obsidian flakes or other material byproducts from tool and utensil-making activities; and graves, human remains, and associated artifacts.

- Historic buildings and structures. Standing or above-ground buildings and structures that are at least 50 years old.

  Historic buildings and structures include, but are not limited to, log cabins, barns, canals, flumes, pipelines, highways, and tunnels.

- Traditional cultural properties. Locations, buildings, structures, and objects that are associated with cultural beliefs, customs, or practices of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community.

  Traditional cultural properties include, but are not limited to, a location associated with the traditional beliefs of a Native American group about its origins or its cultural history; a location where a community has traditionally carried out artistic or other cultural practices important in maintaining its historical identity; and a location where Native American religious practitioners have historically gone, and go today, to perform ceremonial activities. Objects may include petroglyphs, pictographs, rock cairns or other rock structures, trees, and rock outcrops.

Cumulative effects: The combined effects of two or more activities. The effects may be related to the number of individual activities, or to the number of repeated activities on the same piece of ground. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Cut: An area where soil or earth is excavated or removed in conjunction with development activities.

Dedicated site: An area actively devoted to the current use and as delineated on the site plan.

Deer and elk winter range: Areas normally used, or capable of being used, by deer and elk from December through April.

Destruction of wetlands: Loss of the wetlands or any of its component parts, including the filling, draining, or other adverse effect to the sustainable functioning of the wetland.

Developed recreation: Recreational opportunities characterized by high-density use on specific sites and requiring facilities installation. Density of use, amount of site development, and type of recreation site can vary widely across the spectrum of recreation activities.

Developed road prism (SMA): The area of the ground associated with a particular road and containing the road surface, ditch, shoulder, retaining walls, or other developed features. Does not include the natural appearing portions of cut and fill slopes.

Development: Any land division or structure, including but not limited to new construction of buildings and structures, and mining, dredging, filling, grading, paving, and excavation.

Diameter at breast height (dbh): The diameter of a tree as measured at breast height.

Duplex: A building containing two dwelling units and designed for occupancy by two families.

Dwelling, single-family: A detached building containing one dwelling unit and designed for occupancy by one family only.

Dwelling unit: A single unit designed for occupancy by one family and having not more than one cooking area or kitchen.

Earth materials: Any rock, natural soil or any combination thereof. Earth materials do not include non-earth or processed materials, including, but not limited to,

construction debris (e.g., concrete, asphalt, wood), organic waste (e.g., cull fruit, food waste) and industrial byproducts (e.g., slag, wood waste).

Effect on treaty rights: To bring about a change in, to influence, to modify, or to have a consequence to Indian treaty or treaty-related rights in the Treaties of 1855 with the Nez Perce, Umatilla, Warm Springs and Yakima tribes executed between the individual Indian tribes and the Congress of the United States and as adjudicated by the Federal courts.

Emergency/disaster: A sudden unexpected occurrence, either the result of human or natural forces, necessitating immediate action to prevent or mitigate significant loss or damage to life, health, property, essential public services, or the environment.

Emergency/disaster response: Actions involving any development (such as new structures, grading, or excavation) or vegetation removal that must be taken immediately in response to an emergency/disaster event (as defined above). Emergency/disaster response actions not involving any structural development or ground-disturbance (such as use of emergency transport vehicles, communications activities or traffic control measures) are not included in this definition and are not affected by these provisions.

Endemic: Plant and animal species that are found only in the vicinity of the Columbia River Gorge area.

Enhancement (natural resources): A human activity that increases one or more functions of an existing wetland, stream, lake, riparian area, or other sensitive area. Enhancement is generally limited to a wetland, stream, lake, riparian area, or other sensitive area that is degraded. Enhancing an area that is in good or excellent condition may reduce biological diversity and eliminate other natural functions and may not be desirable.

Ephemeral streams (SMA): streams that contain flowing water only during, and for a short duration after, precipitation events.

Ethnography: The descriptive and analytic study of the culture of particular groups. An ethnographer seeks to understand a group through interviews with its members and often through living in and observing it.

Existing industrial complex: Areas including some existing industrial use and where readily visible remnants of past industrial activities exist. The complex includes buildings, including those abandoned or partially abandoned, paved areas, stockpiles, equipment storage areas, quarry areas, etc, and may include isolated patches of vegetation or rock outcroppings surrounded by areas described above. The complex does not extend to include areas where evidence of past activity is no longer readily evident in the landscape. *(Added: CRGC adopted 7/7/08; U.S. Sec. Ag. concurrence 10/8/08)*

Existing use or structure: Any use or structure that was legally established. "Legally established" means: (1) the landowner or developer obtained applicable land use and building permits and complied with land use regulations and other laws that were in effect at the time the use or structure was established, or that were in effect at the time the landowner or developer corrected an improperly established use or structure; (2) the use or structure was initially operated or constructed according to those applicable permits, land use regulations and other laws, or has been operated or constructed according to permits obtained to correct an improperly established use or structure; and (3) any changes to the original use or structure must comply with all applicable permit requirements, land use regulations and other laws that were in effect at the time the change was established.

Exploration, development (extraction and excavation), and production of mineral resources: Includes all or any part of the process of surface, underground, or submerged mining of mineral resources. Minerals include soil, coal, clay, stone, sand, gravel, metallic ore, oil and gases and any other material or substance excavated for commercial, industrial or construction use. For the Management Plan, this definition includes all exploration and mining, regardless of area disturbed or volume mined. Production of mineral resources means the use of portable crushing, onsite stockpiling, washing, milling, screening, or sorting equipment or other similar methods of initial treatment of a mineral resource to transport to another site for use or further processing. Secondary processing such as concrete or asphalt batch plants are considered industrial uses.

Fill: The placement, deposition, or stockpiling of sand, sediment, or other earth materials to create new uplands or create an elevation above the existing surface.

Finished grade: The final elevation of the ground level of a property after construction is completed.

Fire break: A break in ground cover fuels, adjacent to and surrounding buildings.

Footprint: The area that falls directly beneath and shares the same perimeter as a structure.

Forbs: Broad-leaved herbs, in contrast to ferns, fern allies, and grasses and grasslike plants.

Foreground (SMA): One-half mile on either side of a traveled road or trail.

Forest health (SMA): A measure of the robustness of forest ecosystems. Forests are deemed healthy when they have capacity across the landscape for renewal, for the maintenance of wildlife habitats, for recovery from a wide range of disturbances, and for retention of their resilience.

Forest practice (SMA): Any activity conducted on or directly pertaining to forested land and relating to forest ecosystem management including but not limited to growing,

thinning, or removing live or dead forest tree or shrub species, road and trail construction, reforestation, fertilizing, brush control, prevention of wildfire, and suppression of diseases and insects. The removal of hazardous trees is excluded. Uses that include establishment, management or harvest of Christmas trees, nursery stock, or fiber producing tree species requiring intensive cultivation (irrigation, fertilization, etc.) and a harvest rotation of 12 years or less are considered agricultural uses.

Forest practice (GMA): Those activities related to the growing and harvesting of forest tree species, as defined by the Oregon Forest Practices Act or the Washington Forest Practices Act.

Forest products: Commodities produced from a forest, including, but not limited to, timber products, boughs, mushrooms, pine cones, and huckleberries.

Forest stand structure (SMA): The number, types and spacing of tree species, tree sizes, and canopy layers contained in a stand of trees.

Forest use: The growing, propagation, and harvesting of forest tree species and other forest products.

Fully screened: A description of the relative visibility of a structure where that structure is not visible as viewed from a specified vantage point (generally a key viewing area, for the purpose of the Management Plan).

Grade (ground level): The average elevation of the finished ground elevation as defined by the Uniform Building Code.

Grading: Any excavating or filling of earth materials or any combination thereof, including the land in its excavated or filled condition.

Hazard tree (SMA): A tree with a structural defect that will predictably result in whole or partial failure within 1.5 tree lengths of a road or maintained development. A defective tree is hazardous only when its failure could result in danger to people or damage to structures, vehicles, or other property.

Height of building: The greatest vertical distance between the point of lowest finished grade adjoining any exterior wall of a building and the highest point of the roof, such as the highest coping or parapet of a flat roof, the highest deck line of a mansard roof, or the highest ridge of a hip, gable, gambrel, shed or other pitched roof.

Herbaceous: A plant with no persistent woody stem above the ground, with characteristics of an herb.

Herbs: Non-woody (herbaceous) plants, including grasses and grasslike plants, forbs,

ferns, fern allies, and non-woody vines. (Note: Seedlings of woody plants that are less than 3 feet tall shall be considered part of the herbaceous layer.)

Historic buildings and structures: See cultural resource.

Historic survey: Actions that document the form, style, integrity, and physical condition of historic buildings and structures. Historic surveys may include archival research, architectural drawings, and photographs.

Horses, boarding of (GMA): The stabling, feeding, and grooming, or the use of stalls for and the care of horses not belonging to the owner of the property, and related facilities, such as training arenas, corrals, and exercise tracks. These facilities are either operated for a fee or by a nonprofit organization.

Hydric soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

In-lieu sites: Sites acquired by the Army Corps of Engineers and transferred to the Bureau of Indian Affairs for treaty fishing, in lieu of those usual and accustomed fishing areas lost by inundation from reservoir construction. These sites were acquired under the provisions of Public Law 14 and Public Law 100-581, Section 401. Additional in-lieu sites will be provided for.

Indian tribal government: The governing bodies of the Nez Perce Tribe (Nez Perce Tribal Executive Committee), the Confederated Tribes of the Umatilla Indian Reservation (Board of Trustees), the Confederated Tribes of the Warm Springs Reservation of Oregon (Tribal Council), and the Confederated Tribes and Bands of the Yakama Indian Nation (Tribal Council).

Indian tribes: The Nez Perce Tribe, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes of the Umatilla Indian Reservation.

Industrial uses: Any use of land or water primarily involved in:

1. Assembly or manufacture of goods or products,

2. Processing or reprocessing of raw materials, processing of recyclable materials or agricultural products not produced within a constituent farm unit,

3. Storage or warehousing, handling or distribution of manufactured goods or products, raw materials, agricultural products, forest products, or recyclable materials for purposes other than retail sale and service, or

4. Production of electric power for commercial purposes.

Interpretive displays: Signs and structures that provide for the convenience, education, and enjoyment of visitors, helping visitors understand and appreciate natural and cultural resources and their relationship to them.

Key components: The attributes that are essential to maintain the long-term use and productivity of a wildlife site. The key components vary by species and wildlife site. Examples include fledgling and perching trees, watering sites, and foraging habitat.

Key viewing areas: Those portions of important public roads, parks, or other vantage points within the Scenic Area from which the public views Scenic Area landscapes. These include:

Historic Columbia River Highway
Crown Point
Highway I-84, including rest stops
Multnomah Falls
Washington State Route 14
Beacon Rock
Panorama Point Park
Cape Horn
Dog Mountain Trail
Cook-Underwood Road
Rowena Plateau and Nature Conservancy Viewpoint
Portland Women's Forum State Park
Bridal Veil State Park
Larch Mountain
Rooster Rock State Park
Bonneville Dam Visitor Centers
Columbia River
Washington State Route 141
Washington State Route 142
Oregon Highway 35
Sandy River
Pacific Crest Trail

<u>SMA only:</u>

Old Washington State Route 14 (County Road 1230)
Wyeth Bench Road
Larch Mountain Road
Sherrard Point on Larch Mountain

Land division: The division or redivision of contiguous land(s) into tracts, parcels, sites or divisions, regardless of the proposed parcel or tract size or use. A land division includes, but is not limited to, short subdivisions, partitions, and subdivisions.

Landscape setting: The combination of land use, landform, and vegetation patterns that distinguish an area in appearance and character from other portions of the Scenic Area.

Livestock feedlot: Stockyards and commercial livestock finishing yards for cattle, sheep, swine, and fur bearers. Feedlots do not include winter pasture or winter hay-feeding grounds.

Lot line adjustment: Relocation of one or more common boundary lines between two contiguous parcels that does not create additional parcels.

Maintenance: Ordinary upkeep or preservation of a serviceable structure affected by wear or natural elements. Maintenance does not change the original size, scope, configuration or design of a structure.

Maintenance includes, but is not limited to, painting and refinishing, regrouting masonry, patching roofs, grading gravel roads and road shoulders, cleaning and armoring ditches and culverts, filling potholes, controlling vegetation within rights-of-way, removing trees and other roadside hazards within rights-of-way, and testing and treating utility poles.

Mitigation: The use of any or all of the following actions:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Mosaic (SMA): The dispersal of overstory and understory leave trees in irregularly spaced clumps of varying sizes throughout an irregularly shaped created forest opening.

Multifamily dwelling: A dwelling constructed or modified into two or more single-family units.

Native species: Species that naturally inhabit an area.

Natural grade: The undisturbed elevation of the ground level of a property before any excavation or construction operations.

Natural resources (GMA & SMA): Wetlands, streams, ponds and lakes, riparian areas, wildlife and wildlife habitat, rare plants, and natural areas. *(Revised: CRGC adopted 7/13/10; U.S. Sec Ag. concurrence 11/1/10 & 7/1/11)*

Natural resource specialist: A person with professional qualifications, including an academic degree or sufficient professional experience, in the subject matter the specialist is being asked to analyze or evaluate.

Natural resource-based recreation (SMA): Recreation activities, uses, or facilities that essentially depend on the unique natural, scenic, or cultural resources found within the Scenic Area. Campgrounds, trails, boating and windsurfing facilities, swimming beaches, picnic sites, viewpoints, interpretive parks, and similar outdoor recreation facilities are considered resource-based; golf courses, tennis courts, and rental cabins are not.

Nonprofit organization: An organization whose nonprofit status has been approved by the U.S. Internal Revenue Service.

Not visually evident (SMA): A visual quality standard that provides for development or uses that are not visually noticeable to the casual visitor. Developments or uses shall only repeat form, line, color, and texture that are frequently found in the natural landscape, while changes in their qualities of size, amount, intensity, direction, pattern, etc., shall not be noticeable.

Old growth (SMA): A forest stand usually at least 180-220 years old with moderate to high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags, and heavy accumulations of wood, including large logs on the ground.

Operational (SMA): For new agricultural use, an agricultural use shall be deemed operational when the improvements and investments described in the Stewardship Plan are in place on the parcel.

Ordinary high water mark: The mark on all streams, ponds, and lakes that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a vegetative character distinct from that of the abutting upland. In any area where the ordinary high water mark cannot be found, the line of mean high water shall substitute.

Other related major structure (SMA): A structure related to a dwelling on a parcel in the SMA that is less than 40 acres in size, which is not incidental and subordinate to the main use of the property. A building or structure that satisfies the definition of "accessory building" is not an "other related major structure" or a "major development action."

Overstory (SMA): For forest practices, the tall or mature trees that rise above the shorter or immature understory trees.

Parcel:

1. Any unit of land legally created by a short division, partition, or subdivision that was legally recognized under all state laws and local ordinances in effect on November 17, 1986. A unit of land that is eligible for consolidation as provided in the Management Plan shall not be considered a parcel.

2. Any unit of land legally created and separately described by deed, sales contract, or record of survey prior to November 17, 1986, if the unit of land complied with all planning, zoning, and land division ordinances or regulations applicable at the time of creation and up through November 16, 1986.

3. A unit of land legally created and separately described by deed or sales contract after November 17, 1986 if the unit was approved under the Final Interim Guidelines or a land use ordinance consistent with the Management Plan, or by the Forest Service Office prior to the Final Interim Guidelines.

4. A unit of land shall not be considered a separate parcel simply because the subject tract of land:

    A. Is a unit of land solely created to establish a separate tax account;

    B. Lies in different counties;

    C. Lies in different sections or government lots;

    D. Lies in different land use or zoning designations; or

    E. Is dissected by a public or private road.

Practicable: Able to be done, considering technology and cost.

Preexisting: Existing prior to the adoption of the Columbia River Gorge National Scenic Area Management Plan.

Previously disturbed: An area of land where the natural surface has been graded, excavated, paved and/or graveled.

Project area: The geographic area or areas within which new development and uses may cause changes in the character or use of cultural resources, if any such resources exist.

Public use facility: Recreation development(s) that meet the definition of "recreation

facility" in the Management Plan and are open for use by the general public. Private clubs and other facilities limited to members or otherwise restricted in availability shall not be considered public use facilities.

Rare plant species: Used in a generic sense to refer to various categories of sensitive plants cited in federal and state programs.

Recreation facility: A cluster or grouping of recreational developments or improvements located in relatively close proximity to one another, and that are not separated in distance by more than 1/4 mile of land that does not contain any such developments or improvements, except for roads and/or pathways.

Recreation resort: A master-planned development focused on accessing a range of resource-based recreational opportunities, consisting of predominately short-term visitor accommodations and supporting commercial uses. *(Added: CRGC adopted 7/7/08; U.S. Sec. Ag. concurrence 10/8/08)*

Reconnaissance survey: Actions conducted to determine if archaeological resources are present in an area that would be affected by a proposed use. Reconnaissance surveys may include archival research, surface surveys, subsurface testing, and ethnographic research.

Recreation opportunity spectrum (ROS): A means of classifying areas in relation to the types of recreation opportunities and experiences they provide or are appropriate for. The spectrum ranges from primitive (wilderness areas) to urban (highly modified areas).

- Primitive: Remote, inaccessible areas with a high degree of solitude and with resources essentially unmodified.

- Semiprimitive: Areas accessible only by primitive transportation routes, with low to moderately infrequent human encounters and with only subtle modifications to the natural setting.

  Roaded Natural: Roaded areas with moderately frequent human encounters and with resource modifications evident.

- Rural: Roaded areas with moderate to highly frequent human encounters and with the natural setting dominated by cultural modifications.

- Suburban: Areas representing the rural-urban interface, with urban-like roads, structures, highly frequent human encounters, and dominant resource modifications encroaching into the rural landscape.

- Urban: Highly accessible, roaded areas dominated by human encounters and human-related structures.

Recreation resources: Areas and facilities that provide recreation opportunities and experiences. Recreation resources include semi-primitive areas with few facilities and developed sites.

Regularly maintained: An area of land that has been previously disturbed and where periodic actions have been taken to (1) keep the area clear of vegetation (e.g., shoulders, utility yards), (2) limit the height and type of vegetation (e.g., utility rights-of-way), and/or (3) establish and retain non-native vegetation (e.g., landscaped medians, rest area grounds).

Rehabilitation (natural resources): A human activity that returns a wetland, stream, buffer zone, or other sensitive area that was disturbed during construction of a permitted use to its natural or preconstruction condition.

Remnant old forest (SMA): Large trees in the overstory that are well into the mature growth state (older than 180 years).

Repair: Replacement or reconstruction of a part of a serviceable structure after damage, decay or wear. A repair returns a structure to its original and previously authorized and undamaged condition. It does not change the original size, scope, configuration or design of a structure, nor does it excavate beyond the depth of the original structure.

Repair includes, but is not limited to, reroofing a building, replacing damaged guardrails, reconstructing a rotten deck or porch, replacing a broken window or door, replacing a utility pole and associated anchors, replacing a section of broken water or sewer line, replacing a damaged or defective utility line, reconstructing a portion of a building damaged by fire or a natural event, and replacing railroad ties or rails.

Resort core: The portion of a recreation resort formerly occupied by the existing industrial complex. *(Added: CRGC adopted 7/7/08; U.S. Sec. Ag. concurrence 10/8/08)*

Resource-based recreation: Those recreation uses that are essentially dependent upon the natural, scenic, or cultural resources of the Scenic Area and that do not adversely affect those resources upon which they depend.

Restoration (wetlands): A human activity that converts an area that was formerly a wetland back into a wetland. This definition presumes that the area to be restored no longer qualifies as a wetland because of past activities, alterations, or catastrophic events.

Review uses: Proposed uses and developments that must be reviewed by a county planning department, the Gorge Commission, or the Forest Service to determine if they comply with the policies and guidelines in the Management Plan.

Riparian area: The area immediately adjacent to streams, ponds, lakes, and wetlands

that directly contributes to the water quality and habitat components of the water body. This may include areas that have high water tables and soils and vegetation that exhibit characteristics of wetness, as well as upland areas immediately adjacent to the water body that directly contribute shade, nutrients, cover, or debris, or that directly enhance water quality within the water body.

Road: The entire right-of-way of any public or private way that provides ingress to or egress from property by means of vehicles or other means or that provides travel between places by means of vehicles. "Road" includes, but is not limited to:

1. Ways described as streets, highways, throughways, or alleys.

2. Road-related structures that are in the right-of-way, such as tunnels, culverts, or similar structures.

3. Structures that provide for continuity of the right-of-way, such as bridges.

Scenic Area: The Columbia River Gorge National Scenic Area.

Scenic travel corridor: Those portions of Interstate 84, the Historic Columbia River Highway, Oregon Highway 35, and Washington State Routes 14, 141, and 142 located in the Scenic Area and specifically designated to be managed as scenic and recreational travel routes.

Secretary: The Secretary of Agriculture.

Sensitive plant species: Plant species that are (1) endemic to the Columbia River Gorge and vicinity, (2) listed as endangered or threatened pursuant to federal or state endangered species acts, or (3) listed as endangered, threatened or sensitive by the Oregon or Washington Natural Heritage Program.

In the SMA, sensitive plant species also include plant species recognized by the Regional Forester as needing special management to prevent them from being placed on federal or state endangered species lists.

Sensitive wildlife species: Animal species that are (1) listed as endangered or threatened pursuant to federal or state endangered species acts, (2) listed as endangered, threatened, sensitive, or candidate by the Washington Wildlife Commission, (3) listed as sensitive by the Oregon Fish and Wildlife Commission, or (4) considered to be of special interest to the public, limited to great blue heron, osprey, mountain goat, golden eagle, and prairie falcon.

In the SMA, sensitive wildlife species also include animal species recognized by the Regional Forester as needing special management to prevent them from being placed on federal or state endangered species lists.

Service station: A business operated for the purpose of retailing and delivering motor vehicle fuel into the fuel tanks of motor vehicles.

Serviceable: Presently useable.

Shall: Action is mandatory.

Should: Action is encouraged.

Shrub: A woody plant usually greater than 3 feet but less than 20 feet tall that generally exhibits several erect, spreading, or prostrate stems and has a bushy appearance. (Note: For the Management Plan, seedlings of woody plants that are less than 3 feet tall shall be considered part of the herbaceous layer.)

Sign: Any placard, poster, billboard, advertising structure or inscribed surface, pattern or artificial lighting, pictorial or symbolic ornament, emblematic structure, banner, fluttering apparatus, statue, model, ornamental figure, or other visually communicative or expressive device that is visible from an out-of-doors position and is used to advertise or call the public's attention to any public, business, commercial, industrial, recreational or any other activity, object for sale or lease, person or place, or to bear any kind of message. It includes any surface on which a name, text, device, signal, ornament, logotype, or advertising matters is made visible. The meaning of "sign" shall also include any sign currently in disuse, but still visible from an out-of-doors position, and any frame or support structure erected specifically to bear or uphold a sign.

Significant cultural resource (SMA): A cultural resource that is included in, or eligible for inclusion in, the National Register of Historic Places. (The criteria for evaluating the eligibility of properties for the National Register of Historic Places appear in "National Register Criteria for Evaluation" [36 CFR 60].)

Skyline: The line that represents the place at which a landform, such as a cliff, bluff or ridge, meets the sky, as viewed from a specified vantage point (generally a key viewing area, for the purpose of the Management Plan). In areas with thick, unbroken tree cover, the skyline is generally formed by the top of the vegetative canopy. In treeless areas or areas with more open tree cover, the skyline is generally formed by the surface of the ground.

Soil capability class: A classification system developed by the U.S. Department of Agriculture Soil Conservation Service to group soils as to their capability for agricultural use.

Special habitat area: Wetlands, mudflats, shallow water, and riparian vegetation that have high values for waterfowl, shorebirds, raptors, songbirds, upland game, and reptiles.

Special streams: Streams that are primary water supplies for fish hatcheries and rearing ponds.

Stand: A group of trees possessing uniformity in regard to type, age, vigor, or size.

Story: A single floor level of a structure, as defined by the Uniform Building Code.

Streams: Areas where surface water produces a defined channel or bed, including bedrock channels, gravel beds, sand and silt beds, springs and defined-channel swales. The channel or bed does not have to contain water year-round. This definition is not meant to include irrigation ditches, canals, storm or surface water runoff structures, or other artificial watercourses unless they are used to convey streams naturally occurring prior to construction of such watercourses.

For the Management Plan, streams are categorized into two classes: perennial streams and intermittent streams. Perennial stream means a stream that flows year-round during years of normal precipitation. Intermittent stream means a stream that flows only part of the year, or seasonally, during years of normal precipitation.

Structure: That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner. This includes, but is not limited to, buildings, walls, fences, roads, parking lots, signs, and additions/alterations to structures.

Submit: To deliver a document (e.g., land use application, written comment) to a reviewing agency's office by personal delivery, commercial delivery, mail, fax, or E-mail. When a document must be submitted within a specified period, it must arrive at the reviewing agency's office by the close of business on the last day of the specified period.

Subsurface testing: Any procedure that removes material from beneath the ground surface for the purpose of identifying cultural resources, such as shovel tests, posthole digger tests, and auger borings.

Suitability: The appropriateness of land for production of agricultural or forest products or for recreation, considering its capability for production; surrounding uses and features associated with development; compatibility with scenic, cultural, natural and recreation resources; compatibility among uses; and other cultural factors, such as roads, powerlines, dwellings, and size of ownership.

Thinning (SMA): A forest practice intended to create favorable conditions for the continued growth of trees within an existing stand of trees. A thinning becomes a forest opening in coniferous forests when the average canopy closure of the overstory layer is zero or less than 40 percent and the understory layer is less than

60 percent average canopy closure of trees averaging less than 5 inches diameter at breast height. A thinning becomes a forest opening in oak woodlands when the total average canopy closure is less than 25 percent.

Total canopy closure (SMA): For forest practices, the percentage measuring the degree to which all layers of the tree canopy combine together to block sunlight or obscure the sky as measured from below.

Travelers accommodations: Any establishment having rooms rented or kept for rent on a daily or weekly basis to travelers or transients for a charge or fee paid or to be paid for rental use or use of facilities.

Treatment (SMA): For forest practices, a site-specific operation that carries out the forest management objectives for an area.

Treaty rights or other rights: Rights reserved by the Indian tribes through the Treaties of 1855. These include the right of fishing at all usual and accustomed places, as well as the privilege of pasturing livestock and hunting and gathering on open and unclaimed lands in common with the citizens of the states.

Tributary fish habitat: Streams that are used by anadromous or resident fish for spawning, rearing and/or migration.

Understory (SMA): For forest practices, the shorter or immature trees below the tall or mature overstory trees.

Undertaking: Any project, activity, program or development or change in land use that can result in changes in the character or use of a cultural resource, if any such cultural resources are located in the area of potential effects. For federal undertakings, the project, activity, or program must be under the direct or indirect jurisdiction of a federal agency or licensed or assisted by a federal agency. Undertakings include new and continuing projects, activities, or programs and any of their elements [36 CFR 800.16(y)].

Unimproved lands: Lands that generally do not have developments such as buildings or structures.

Upland: Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands.

Uses allowed outright: New uses and developments that may occur without being reviewed by a county planning department, the Gorge Commission, or the Forest Service to determine if they are consistent with the Management Plan.

Utility facility: Any structure that provides for the transmission or distribution of water, sewer, fuel, electricity, or communications.

Vested right: The right to develop or continue to develop a use, development or structure that was reviewed and approved pursuant to this Management Plan.

Viewshed: A landscape unit seen from a key viewing area.

Visual quality objective (VQO): A set of visual management goals established by the Forest Service to achieve a desired visual objective. These objectives include retention and partial retention, and others in the Mt. Hood and Gifford Pinchot National Forest Plans.

Visually subordinate: A description of the relative visibility of a structure or use where that structure or use does not noticeably contrast with the surrounding landscape, as viewed from a specified vantage point (generally a key viewing area, for the Management Plan). As opposed to structures that are fully screened, structures that are visually subordinate may be partially visible. They are not visually dominant in relation to their surroundings. Visually subordinate forest practices in the SMA shall repeat form, line, color, or texture common to the natural landscape, while changes in their qualities of size, amount, intensity, direction, pattern, etc., shall not dominate the natural landscape setting.

Water-dependent: Uses that absolutely require, and cannot exist without, access or proximity to, or siting within, a water body to fulfill their basic purpose. Water-dependent uses include, but are not limited to, docks, wharfs, piers, dolphins, certain fish and wildlife structures, boat launch facilities, and marinas. Dwellings, parking lots, spoil and dump sites, roads, restaurants, trails and paths, trailer parks, resorts, and motels are not water-dependent.

Water-related: Uses not directly dependent upon access to a water body, but whose presence facilitates public access to and enjoyment of a water body. In the GMA, water-related uses shall be limited to boardwalks, trails and paths, observation decks, and interpretative aids, such as kiosks and signs.

Wetlands: Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. This does not include riparian areas, rivers, streams, and lakes.

Wetlands functions: The beneficial roles that wetlands serve, including storage, conveyance, and attenuation of floodwaters and stormwaters; groundwater recharge and discharge; protection of water quality and reduction of sediment and erosion; production of waterfowl, game and non-game birds, mammals, and other living resources; protection of habitat for endangered, threatened, and sensitive species; food chain support for a broad range of wildlife and fisheries; educational,

historical, and archaeological value protection; and scenic, aesthetic, and recreational amenities.

Winery: An agricultural facility used for processing grapes into wine, including laboratories, processing areas, offices, and storage areas. A winery is distinct from a wine sales/tasting room; each of these uses must be explicitly reviewed and approved.

Wine sales/tasting room: A facility that is accessory to a winery and used for tasting and retail sales of wine, including interior space (e.g., wine bar, sitting room) and exterior space (e.g., patio, veranda). A wine sales/tasting room shall not be used for preparing or serving meals or hosting weddings, receptions or other commercial events, unless allowed, reviewed and approved under the "Commercial Events" provisions in Part II, Chapter 7: General Policies and Guidelines of this Management Plan. A wine sales/tasting room is distinct from a winery; each of these uses must be explicitly reviewed and approved.

Woody plant: A seed plant (gymnosperm or angiosperm) that develops persistent, hard, fibrous tissues.

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Comments on the Air Quality (Chapter 4) and Coal Dust (Chapter 6) Sections of the Draft EIS for the Proposed Tongue River Railroad Company, Inc. Rail Construction and Operation in Custer, Powder River and Rosebud Counties, Docket No. FD 30186, Surface Transportation Board (STB), Office of Environmental Analysis (OEA)

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Introduction

The Draft EIS attempts to analyze the potential environmental impacts of the Tongue River Railroad Company's (TRRC) October 2012 revised application to the STB requesting authority to construct and operate a rail line in southeast Montana. In TRRC's December 2012 supplemental application, TRRC identified its preferred route for the proposed Tongue River Railroad as the 42-mile Colstrip Alternative, which would travel between Colstrip, Montana, and the Ashland/Otter Creek areas of Montana. The Draft EIS purportedly analyzes the environmental impacts of the proposed rail line and alternatives, including the No-Action Alternative.

These comments specifically focus only on the Air Quality and Coal Dust impacts of the proposed action and on how these impacts affect the interests of the Northern Cheyenne Tribe (hereafter "Tribe"). As the Draft EIS notes, "[T]he Northern Cheyenne Indian Reservation borders the west side of the Tongue River in the project area near Ashland."[2] In addition, the mines that would be the source of coal for the proposed action would also be located very close to the Tribe's western boundaries.[3]

[1] Resume provided in Attachment A.

[2] See file _Introductory_Material.pdf, p. 28.

[3] See file _Introductory_Material.pdf, p. 36 (S-10, Figure 2).

As detailed below, there are numerous flaws and unsupported assumptions in the STB's analysis of the potential adverse air quality impacts in the project area. As a result, it appears that the STB has seriously understated the potential impacts to air quality on the Northern Cheyenne Reservation, which is a Class 1 airshed.

General Comments

[A] The Draft EIS Improperly Characterizes the Impacts from Air Quality and Coal Dust Due to the Project

In the Abstract, describing the proposed action, the STB states that:

> "TRRC proposes to construct and operate a 42-mile rail line (the Colstrip Alternative) between Colstrip, Montana and the Ashland and Otter Creek areas of Montana. The Board's Office of Environmental Analysis (OEA) and the cooperating agencies have prepared this Draft Environmental Impact Statement (EIS), which analyzes the environmental impacts that could occur if TRRC were to construct and operate the proposed rail line. This Draft EIS analyzes the environmental impacts of ten build alternatives and the No-Action Alternative. Any of the build alternatives could have minor to highly adverse impacts on the following resources: transportation, greenhouse gases and climate change, noise, biological resources, water resources, visual resources, cultural and historical resources, land resources, geology and soils, socioeconomics, and environmental justice. All other resources would experience negligible impacts. OEA has included draft recommended mitigation measures in this Draft EIS. These mitigation measures will be considered by the Board as potential conditions if the Board decides to grant TRRC authority to construct and operate the rail line."[4]

We note that the Abstract quoted above, by not including "Air Quality" or "Coal Dust" among the resources that could have "minor to highly adverse" impacts, indicates that these would have "negligible" impacts. As detailed below, this characterization of both the Air Quality and the Coal Dust impacts due to the project as "negligible" is based on numerous unsupported and optimistic assumptions in the analysis by the STB/OEA.[5] Specifically, the STB has not properly

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[4] *Ibid.*

[5] I recognize that, all of its flaws notwithstanding, the Draft EIS does admit that air quality impacts from its cumulative assessment (i.e., including the project and the identified 18 or so other projects whose impacts would likely coincide in time/space) are not negligible:

> "OEA determined that the cumulative impacts of the proposed rail line and the other projects that OEA identified <u>could affect</u> grade-crossing safety, grade-crossing delay, <u>air quality</u>, greenhouse gases and climate change, biological resources, water resources, visual resources, cultural resources, geology and soils, paleontological resources, land use and recreation, energy resources, and socioeconomics." (emphasis added) See file _Introductory_Material.pdf, p. 24-25 (Q&A-14/15).

assessed air quality impacts to lands and resources (including agriculture, water quality, recreation, etc.) belonging to and affecting the Tribe.[6]

[B] The Entire Air Quality Analysis in the Draft EIS is Inappropriately Censored by Reliance on the Board's "Thresholds"

In the Draft EIS, the STB discusses the impacts from trains that will be transporting coal as a result of this proposed action and states that:

> "OEA used a computer model to predict where the trains from the proposed rail line would travel and to identify rail lines that would experience an increase in rail traffic. The model identified segments of rail where the volume of traffic could increase beyond the Board's thresholds for environmental analysis (an increase of eight trains per day or more for areas in compliance with national air quality standards and an increase of three trains per day or more for areas not in compliance with national air quality standards). OEA analyzed the potential environmental impacts that could occur on these rail segments due to increased rail traffic."[7]

I note that the Draft EIS does not include any discussion or support (that I could find) which justifies the Board's threshold (i.e., an increase of eight trains per day or more for areas in compliance with national ambient air quality standards (NAAQS) and an increase of three trains per day or more for areas not in compliance with NAAQS). It is not clear how these thresholds were established. Specifically, it is not clear which of the several NAAQS were controlling in establishing these thresholds – i.e., the PM2.5 NAAQS, the PM10 NAAQS, the CO NAAQS, the NOx NAAQS, or some other NAAQS. Clearly, assumptions on the emissions of pollutants (from the locomotives) as well as from coal dust, brake wear dust and re-entrained track-side dust would be fundamental to and foundational to establishing these thresholds.

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[6] In fact, the analysis misleads in its likely impacts on the Tribe. For example, in Chapter 4, page 4-8, the Draft EIS states that "[N]one of the build alternatives would pass through Lame Deer or the Northern Cheyenne Reservation." While that may be true as a factual matter, in context, it appears to imply that therefore there should not be air quality impacts on the Tribe. This is highly misleading. Several of the route alignments are located immediately adjacent to the Tribe's boundaries; as such, there are likely to be significant adverse air quality impacts on the Reservation, both during construction and operation of the project.

[7] See file _Introductory_Material.pdf, p. 14 (Q&A-4)

The entire analysis in the Draft EIS is flawed because of reliance on these unsupported "thresholds." As the Draft EIS states:

> "OEA assessed the potential environmental impacts that could occur because of increased rail traffic on rail lines that would experience an increase beyond the Board's thresholds for environmental analysis. This Draft EIS does not consider impacts on rail lines that would not experience a net increase in rail traffic because of construction and operation of the proposed rail line or that <u>would experience an increase less than the Board's thresholds for environmental analysis</u>."[8] (emphasis added).

Thus, since the Draft EIS clearly relies on these "thresholds," and only considers those rail alternative routes/volumes that exceeded these "thresholds," the manner in which these "thresholds" were established, along with all supporting details, including all calculations and assumptions should be provided for public review. As it stands, by not providing this basic detail, the Draft EIS lacks adequate transparency.

[C] The Analysis is Not Transparent Due To Its Reliance on the Integrated Planning Model

Further, on this point, the Draft EIS relies on the Integrated Planning Model (IPM)[9] to determine the various rail route alternatives and volumes[10] (before censoring them as discussed above).

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[8] See file _Introductory_Material.pdf, p. 22 (Q&A-12)

[9] See, for example, file _Introductory_Material.pdf, p. 21 (Q&A-11), as follows:

> "[B]ecause there were so many variables that needed to be considered to determine where the trains would move, OEA used a computer model called the Integrated Planning Model (IPM). The model determines the least overall cost for meeting U.S. electric demand. In determining the least cost solution, IPM identifies where each coal plant obtains the coal that it consumes and how much it will consume. The model determines the amount of coal and thus the number of trains needed to transport the coal. <u>Inputs to the model included coal production and transportation costs, national and international coal distribution patterns, and economic and regulatory uncertainties such as low natural gas prices and carbon dioxide emission regulations that could affect coal markets in the future</u>." (emphasis added)

[10] For example, the Draft EIS notes that:

> "[T]he estimated coal dust emission rates were based on the maximum estimated train traffic for any scenario to provide a conservative estimate (high production scenario, southern alternatives, 26.7 trains per day…" (internal citations omitted). See Appendix G, p. G-11.

Yet, there is no discussion in the Draft EIS regarding this model and whether the myriad assumptions made in its implementation are appropriate or reliable. For example, there is little discussion on any calibration or back-testing that may indicate or shed light on the reliability of the IPM results.

Therefore, all of the general and specific issues discussed below relating to Air Quality and Coal Dust impacts to the Tribe are underpinned by these two basic and unsupported assumptions – namely on the use of the IPM model with no discussion as to its reliability in the current context; and the further censoring of the IPM output routes/volumes using the unsupported Board's "thresholds." The validity of Draft EIS is significantly compromised due to the lack of discussion and transparency on these two issues. The STB should consider reissuing the Draft EIS, correcting these major deficiencies.

The above notwithstanding, we provide the following additional general comments.

[D] The Overall Assessment of Air Quality Impacts is Simplistic

Summarizing the results of its Air Quality analysis (excluding climate change impacts), the Draft EIS states that:

> "OEA modeled the potential effects of the proposed rail line on air quality in the project area. OEA found that construction and operation of the proposed rail line would not cause the concentrations of nitrogen dioxide, carbon monoxide, lead, particulate matter, or sulfur dioxide in the air to exceed the national standards for air quality. The addition of the project-related trains to existing rail traffic could adversely affect air quality along some existing rail lines outside of the project area, but would not cause concentrations of pollutants in the air to exceed national standards."[11]

I note that the air quality impacts on the resources of the Tribe were not specifically addressed in the DEIS – which seems to focus entirely on NAAQS compliance in the "project area" as the only end point of the air quality analysis.

This estimate of 26.7 trains per day, which is noted to be "conservative" and is widely used as such as a basic input in estimating "maximum" impacts is itself simply an output of the IPM, including all of its assumptions and uncertainties.

[11] See file _Introductory_Material.pdf, p. 15-16 (Q&A-5-6)

For reasons that are discussed below, this is a major (and likely fatal) shortcoming of the entire analytical framework of the DEIS – affecting all of the impacts analyses and not just that for Air Quality. By assessing the Air Quality impacts "in the project area" but not specifically on the resources of the Tribe, in effect, the analysis assumes that impacts throughout the "project area" are of equal importance.

This (implicit) assumption is false. Impacts are not the same everywhere in the "project area." That is, the same level of predicted air quality (i.e., concentrations of specific pollutants derived from modeling) even assuming the stated modeling was done correctly from a technical standpoint (which we specifically do not believe or concede) can have different impacts at different locations. We note that the Tribe's lands are designated as a Class I area, deserving of special protection for numerous air quality related values, including visibility, haze, and deposition.

As an example, let's say that the predicted (i.e., modeled) maximum concentration of PM10 adjacent to a certain build alternative is X ug/m3. Let us further assume that X is smaller than the NAAQS for PM10 in this instance. One possible conclusion from this analysis is that the impact is therefore "negligible" (from a NAAQS compliance standpoint). Yet, the predicted concentration of PM10 (and its constituents, say toxic metals) could be deposited into the Tongue River, which is adjacent to certain of the build alternatives. And, as a result, this deposition could adversely affect the ability to fish, swim, or recreate in the river. From this latter standpoint, the predicted PM10 concentration is no longer a "negligible" impact. Thus, context matters. NAAQS is not the only attribute that is appropriate for the air quality assessment. And, specific locations within the "project area" matter. The air quality analysis presented in the Draft EIS does not distinguish or consider such distinctions. As a result, it draws simplistic and incorrect conclusions.

[E] The Coal Dust Impacts Analysis is Not Reliable Since the Input Source Term Quantifying Coal Dust Emissions Is Not Reliable

With regards to coal dust and its effect on human health, the Draft EIS states that:

> "OEA analyzed the risks of airborne coal dust and determined that exposure would be within applicable standards and guidelines. The aggregate concentration of all types of particulate matter, including airborne coal dust, would be below air quality standards for particulate matter. OEA also analyzed how coal dust could affect human health if it were to be ingested by humans or to make its way into soil or water. OEA found that the concentrations of all of the chemical components of coal dust would be below the screening levels for human exposure in soil, dust, water, and fish. OEA concluded that coal dust from rail cars on the proposed rail line would not affect human health."[12]

I disagree with this analysis and conclusion. The entire coal dust analysis is dependent on a correct assessment of the source(s) of the coal dust due to the project – i.e., the coal dust that is not only directly emitted from the rail cars themselves (and which can become airborne and then disperse and deposit not just adjacent to but throughout the project area) but also that which is re-entrained as a result of the passage of trains affecting trackside dust which will accumulate over time. I have significant concerns with how each of these "source" terms has been handled in the analysis. For example, as discussed below, re-entrainment of coal dust is not analyzed at all.[13] Based on my concerns, I do not believe that the analysis is appropriate. Thus, I do not believe that the conclusions of the analysis can or should be relied upon.

The Draft EIS also states as follows, with regards to coal dust and its impacts on surface waters:

> "OEA analyzed the potential effect of coal dust from rail cars on the proposed rail line that could make its way into surface waters. OEA found that coal dust constituents in surface water would be below screening levels for ecological exposure, except for barium. The conservative analysis assumptions overestimate the amount of barium that would actually be found in surface waters such that actual barium concentrations would be lower and below screening levels."[14]

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[12] See file _Introductory_Material.pdf, p. 16 (Q&A-6)

[13] See Chapter 4, p. 4-14.

[14] See file _Introductory_Material.pdf, p. 17 (Q&A-7)

Again, as with the impacts on human health from coal dust, as discussed above – the key driver of the surface water impact analysis is the proper assessment of the "sources" of coal dust. In this regard, I show that the analysis falls short – thereby making any conclusions unreliable.

[F] The Draft EIS Improperly Attempts to Dismiss Predicted Significant Impacts

As a general flaw, at times when the predicted impacts are above corresponding thresholds and thus inconvenient, the Draft EIS minimizes such results of significance by claiming, without support or discussion, that the underlying analysis "overestimates" these impacts and that actual impacts would be lower. I provide two such examples.

First, in discussion the level of barium (present in coal dust) impacts to surface waters, the Draft EIS states:

> "OEA also found that estimated concentrations of coal dust in soil, sediment, and surface water would be below screening levels for ecological exposure, with the exception of barium in surface water. OEA's analysis, however, overestimated the amount of barium that would actually be found in surface waters so that actual barium concentrations resulting from the proposed rail line would be lower and below screening levels."[15]

Second, in relation to the impacts of NO2, which even the STB's analysis in the Draft EIS shows will result in an exceedance of the NAAQS, the Draft EIS states:

> "The modeling results indicate that the 1-hour NO2 standard also would be exceeded for the medium production scenario in 2023 (for the northern and southern alternatives) and the high production scenario in 2037 (for the southern alternatives only). The AERMOD model has been documented in a number of studies to over-predict the highest 1-hour NO2 concentration from 1.7 to 2 times the observed concentration (RTP Environmental Associates 2013, American Petroleum Institute 2012, Golder 2011). Therefore, anticipated maximum 1-hour NO2 concentrations would be expected to be less than the modeled levels. The maximum modeled 1-hour NO2 concentrations would not exceed the NAAQS in any analysis year with a downward adjustment for this model bias."[16] (internal citations omitted)

[15] See file _Introductory_Material.pdf, p. 39 (S-13).

[16] See Chapter 4, p. 4-17 through 4-18.

These are misleading characterizations and should be struck from the Draft EIS. If the STB/OEA believes that its analysis overestimates a predicted impact, it should provide specifics of how and why this overestimate occurred rather than vague and unquantified references to overestimation and bias.

The STB should then correct or not include such overestimate. Or, the STB should provide its analysis of what it believes the "actual" (as opposed to the overpredicted) impact will be. But, in reality, no one – not even the STB – can provide an analysis of the "actual" future impact. That is why analyses rely on predictions. And, predictions can include, with good reason, conservative assumptions. That is not because the goal is to inflate a future impact – it is simply a prudent practice in order to accommodate the many unknowns inherent in a predictive analysis that can result in underestimating impacts.

For example, as the STB notes and as I discuss above, much is unknown and unknowable about how the various rail alternatives were developed in the first place. Models used at every stage of the analysis rely on myriad assumptions – not all of which are "conservative" leading to only high levels of impacts.

In the first example above the analysis in the Draft EIS does not include the quantitative impacts of train derailments and the resultant spillage or vast quantities of coal directly into the Tongue River or into its feeder streams or near its banks and thence to the waters of the river. Should that occur, it is certain that not only barium but most other dust/metal impacts to water (and sediments) would be large, persiatent and therefore significant – directly affecting the Tribe in a most adverse manner. Nor can the STB assure that such derailments will never occur in the future. No one can. For example, well publicized derailments in the Powder River Basin have occurred in the recent pass and there cannot be guaranteed assurances by anyone, much less the STB, that they will not occur in the past.

In the second example above, the Draft EIS notes overestimation by AERMOD but does not discuss underestimation of the emission rates used. For example, actual emissions rates from locomotive and other equipment are affected by deterioration of the underlying equipment. It is not unheard of that equipment sometimes do not meet respective standards. This is especially

true of mobile equipment. Therefore, by using emission rates corresponding to the standard, the analysis assumes 100% compliance with standards, which is not a conservative assumption.[17] Use of higher non-compliant emission rates, such as may occur in practice, will result in higher, not lower impacts.

And, in addition, the analysis for NO2 compares the estimated concentrations to the NAAQS today. NAAQS are subject to change (and have generally been subject to downward revisions). If in the future, the NAAQS becomes lower then the predicted impacts would be even greater on a relative basis.

For all of these reasons, the STB should, at the very least, not mischaracterize the results of its own analysis. The public is entitled to a straightforward, transparent, assessment and interpretation of impacts – not a qualitative, backdoor, misleading, revisionist interpretation of the analysis – when the results are inconvenient.

[G] Conclusion

As detailed above, there are significant basic flaws with the overall analytical framework for the air quality analysis in the Draft EIS. Unless corrected or properly supported, any additional "analyses" which rest on these basic framework assumptions cannot lead to reliable conclusions. Nonetheless, I point out some of the additional issues and technical shortcomings in the Air Quality and Coal Dust analyses as presented in the Draft EIS.

[17] The analysis does not contain any information regarding the level of compliance of the many current locomotive in the BNSF fleet with applicable standards. It is therefore an implicit and unsupported non-conservative assumption that all of the locomotives in the fleet are and will comply with their respective standards at all times.

Specific Comments on Air Quality

In addition to the General Comments above, I provide the following specific comments on the Air Quality analysis presented in the Draft EIS in this section.

[A] Construction Impacts Are Not Temporary And Are Not Demonstrated To Be Negligible

The Draft EIS's own estimates of construction fugitive dust (i.e., PM10, as an example), as shown in Tables 4-11 or 4-12 show that emissions of PM10 will be thousands of tons per year, depending on the alternative considered. For the Decker alternative, using 12 month construction schedule, for example, emissions are 2,583 tons per year.

Yet, the Draft EIS concludes that:

> "In summary, air pollutant emissions during construction would be temporary and at any given time would occur only where construction is occurring or along roads traveled by construction vehicles. Pollutant concentrations during construction are expected to remain within applicable air quality standards…. OEA concludes that construction and operation impacts would be negligible."[18]

I believe that characterizing construction emissions as "temporary" is misleading when, in fact, depending on the build alternative/production scenario, construction could last for 3 to 6 years, the former on a year round basis.[19] While this may be "temporary" only in the sense that it will not last for decades, anything that lasts for multiple years is hardly "temporary." I suggest the Draft EIS remove references to "temporary" in this context due to its erroneous implication.

I also disagree with the STB's statement that "concentrations during construction are expected to remain within applicable air quality standards." Here again, the truth of that statement depends on when and where the NAAQS or MAAQS assessments are conducted. It is clear that ambient air will be affected adversely by construction activities. Even though the most significant impacts will occur within and adjacent to the railroad right-of-way and along roads supporting

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[18] See Chapter 4, p. 4-1. See also Section 4.5.1.1, p. 4-13.

[19] See Appendix E, Table E.1-104.

construction, many of the NAAQS and MAAQS have very short averaging times,[20] such as the hourly MAAQS for NO2, ozone, sulfur dioxide, and hydrogen sulfide; hourly NAAQS for ozone; 3-hour average NAAQS for sulfur dioxide; 8-hour average NAAQS for carbon monoxide and ozone; 8-hour average MAAQS for carbon monoxide; 24-hour average NAAQS for sulfur dioxide, PM10, and PM2.5; and 24-hour average MAAQS for sulfur dioxide and PM10.

The emission calculations presented in the Draft EIS simply do not provide enough details for each of the pollutant emissions on very short-term basis so that the short term NAAQS and MAAQS can be properly assessed. Construction emissions are discussed in Section E.1.5 in Appendix E of the Draft EIS.[21] However, none of the emissions summary Tables E.1-109 through E.1-128 show the maximum hourly construction emissions for any of the alternatives. While Tables E.1-120, E.1-121, and E.1-123 show the estimated daily emissions, that is not sufficient to analyze impacts on a still-smaller time scale.

Thus, based on a lack of emission estimates, coupled with similar lack of modeling for short term impacts, there is no basis to conclude that all construction impacts will be "negligible" even when the assessment is purely limited to that of NAAQS and MAAQS compliance.

In addition, I disagree with the STB's suggestion that the only meaningful impact of construction impacts is comparison with NAAQS and MAAQS. I am particularly concerned with the impacts on the Tribe's lands and the Tongue River (which is a critical resource for the Tribe) due to deposition of emissions from the construction phase on many of the potential alternatives such as portions of the Decker, Tongue River, and even Colstrip alignments. I did not see any specific assessment of such impacts on the Tribe in the Air Quality section.[22]

Finally I note that construction impacts will be occurring along with many other projects as discussed in the cumulative analysis. These will be additive and further exacerbate impacts on

[20] See Chapter 4, Table 4-2, p. 4-7.

[21] I note that many of the Tables in this section reference "Table E.1-177" which does not exist . See, for example, FN1 to Tables E.1-89. E.1-90, E.1-91, E.1-92, E.1-93, and E.1-94.

[22] In fact, a search of the words 'Tribe" or "Cheyenne" for the entire Air Quality section Appendix E, where the details of the analysis are presented, did not result in a single instance of these words. Thus, the Air Quality analysis is deficient since it did not conduct any specific and particular analysis of impacts on the Tribe's resources.

the Tribe's resources. These cumulative impacts during construction have not been properly quantified or assessed.

[B] Construction Impacts Rely on Information Provided By TRRC That Are Unverifiable

Construction air quality impacts for all alternatives other than Colstrip rely on ratios such as those listed in Appendix E, Table E.1-105 (which, in turn appear to be based on earthwork volumes listed in Table E.1-106), which were provided by TRRC. However, no details as to how these earthwork volumes were estimated or calculated and the underlying assumptions that were made in arriving at these ratios are not provided anywhere in the Draft EIS.

Even assuming that the details provided by TRRC relating to the Colstrip alternative are correct[23] – and this too is unveriable as presented in the Draft EIS – the assessment of construction impacts for all of the other alternatives rests on the ratios of these unverifiable earthwork volumes from TRRC.

Thus, using these unverifiable earthwork volumes constitutes an act of faith. The Draft EIS should provide the underlying cut/fill drawings along each alignment and similar documention which presumably provide the basis of the earthwork estimates received from TRRC.

[C] The Air Quality Analysis Improperly Limits the Study Area

Addressing the study area, the Draft EIS states that:

> "Potential impacts on *criteria pollutant* concentrations relative to the National Ambient Air Quality Standards (NAAQS) and Montana Ambient Air Quality Standards (Montana AAQS) would be negligible beyond the immediate vicinity (less than 1 kilometer) of the rail line right-of-way, so detailed air quality modeling for the NAAQS assessment is limited to this smaller portion of the study area."[24]

[23] See, for example, details provided in Appendix E, Tables E.1-89, E.1-103, E.1-92, E.1-108, etc. showing the list of equipment that will be required,equipment sizes, equipment fuel consumption rates, and the expected annual hours of operation of the each type of equipment.

[24] See Chapter 4, p 4-2.

I know of no empirical reasons or any laws of nature that would justify constraining the study area for the entire air quality analysis to just the immediate vicinity – i.e., less than 1 km of the rail line right of way. I note again that the impact of air quality is not just felt in its effect on the NAAQS and MAAQS; additional impacts will occur due to deposition and transport of pollutants away from this immediate area during construction and during actual operation. For example, emissions of PM2.5 will likely travel far from just the vicinity of the rail line. So will emissions from gaseous pollutants such as NOx. Of course, any deposition onto adjacent roads and/or the Tongue River can be further dispersed and transported away from the immediate vicinity via secondary processes. Thus, there is no justification to handicap the entire analysis by severly constraining the study area as noted above. This conceptually unsupported assumption is a fatal flaw.

[D] Fugitive Dust Control Levels Are Unsupported

Appendix E, Table E.1-107 shows uncontrolled and controlled emission factors for fugitive dust for PM10 and PM2.5. In each case, the control efficiency based on 'watering" is assumed to be 50%. However, no basis is provided for this assumption.

Dust control via watering is subject to many variables, not limited to: the quantity of water used; the manner in which the water is applied to the activity causing the dust, including proximity of the watering equipment; the type of atomization used; the size distribution of the water droplets; and the training of the operators.

Thus, a control efficiency of 50% is not automatically guaranteed without much more detail. The Draft EIS does not provide any support for assuming the 50% control efficiency used in its emission estimates. Thus, the estimated emissions, just from this standpoint alone, are unsupported and too high.

[E] The Use of Wind Speeds From The Birney Station May Not Be Conservative

The Draft EIS states that:

> "[T]he average wind speed at Birney (2.3 meters per second, about 5.1 mph) is lower than at Miles City (4.4 meters per second, about 9.9 mph). Use of the lower

> wind speed at Birney results in a more conservative analysis (higher pollutant concentrations) than the higher wind speed at Miles City. Accordingly, OEA used the data from the Birney station for the air quality analysis."[25]

While the use of the lower wind speed may result in a more conservative analysis from a dispersion modeling standpoint, these lower wind speeds, if used for the emissions calculations from various sources of fugitive dust will not result in conservative emissions estimates. Since emissions estimates are critical inputs to the dispersion modeling analysis, in addition to the meteorological data such as wind speeds, the overall impact of using lower wind speeds – both for emission estimates and for dispersion modeling – cannot be discerned. The Draft EIS should fully clarify this issue.

[F] The Analysis Does Not Use Appropriate Coal Particle Size Distributions

The particle size distribution of the coal that will be emitted as dust, and also from spillage and reentrainment of previously deposited dust is an obviously critical parameter in the air quality impacts analysis. Since large particles are expected to deposit closer to the source or activity while smaller particles will travel much farther, it is important to establish the proper size distributions for the coal particles.

Additionally, PRB coal is known to be highly friable,[26] subject to breakage under many factors. Thus, the particle size distribution of PRB coal in the rail cars, which is subject to vibration, settling, abrasion, etc., is an important aspect of the inputs to the analysis.

However, the entire Draft EIS analysis relies on unsupported particle size distribution data not from the PRB but from Australia – with no discussion whatsoever as to why the characteristics of Australian coals are relevant to the current analysis. In Table E.1-42, the PM10 and PM2.5 fractions of coal are assumed to be 45% and 8.6% of TSP, respectively, referencing work from Australia. Although there is additional discussion of this in Appendix E, Section E.2.3.2, that discussion provides even less assurance for this assumption. In fact, the additional discussion in

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[25] See Chapter 4, p. 4-6.

[26] See, for example, http://krtcommodities.com/files/PRB%20COAL%20DEGRADATION.pdf.

Section E.2.3.2 provides no comfort that the assumed size fractions have any resemblance to that from PRB coals:

> "Ideally, the characterization of the particle size distribution for the proposed rail line could be improved by matching the coal characteristics of the coal that TRRC would haul with one of the 11 coals assessed in the Katestone Scientific (2000) study (Table E.2-1). <u>However, the coal characterization information on these 11 coal types is not available</u>."[27] (emphasis added)

As to the larger sized particles, whose dispersion was not modeled, the Draft EIS states:

> "The majority of the coal dust particles are large (greater than 250 microns) and deposit quickly after being lifted from the moving train, and therefore, would be deposited within 5 meters (16 feet) of the rail line and would not contribute to nuisance impacts beyond the right-of-way. OEA estimated that these large coal dust particles would account for about 62 percent of the total mass of coal dust emitted from rail line operation."[28]

The analysis provides no citations or support for any of the assumptions excerpted above – such as the fact that "majority of the coal dust particles are large (greater than 250 microns)," that these particles would be "deposited within 16 feet of the rail line,"[29] or that these particles "account for about 62 percent of the total mass of coal dust." Without supporting documentation for these assumptions, there is no basis to assess the accuracy of the coal dust dispersion analysis in the Draft EIS.

In summary, the particle size distributions assumed in the analysis – both for the larger fractions and for the smaller fractions – are simply unsupported.

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[27] See Appendix E, p. E-133.

[28] See Chapter 4, p. 4-18.

[29] If, as the Draft EIS contends that no particles greater than 250 microns have been ever found more than 16 feet of a rail line in the PRB, it should provide documentary proof of this patently absurd assumption.

Specific Comments on Coal Dust

[A] Coal Dust Emissions Are Significantly Underestimated

OEA has concluded that coal dust from trains on the proposed rail line would not harm human health or the environment.[30] This is not supported by the analysis presented. As presented, the total TSP, PM10, and PM2.5 emissions due to coal dust, even for the high production scenario range from several hundred tons per year (depending on route alternative) for TSP to several tens of tons per year for PM2.5.[31] For the Decker alternative in this high production scenario, which I will use as an example, this table shows TSP emissions of 168.3 tons/year due to wind driven emissions from the tops of the loaded rail cars.

I note that these emission estimates appear to be quite low. For example, in a presentation to members of the STB Board in 2009, BNSF indicated that coal dust emissions from the tops of rail cars are 600 pounds per car over a 400 mile route.[32] Thus, for the Decker alternative (distance 51.1 miles[33]), the per car emissions from the top should be around 76 pounds. Using the Draft EIS assumption of 125 cars per train,[34] the coal dust emissions from the top would be 4.79 tons per train. Per the Draft EIS, in the high production scenario this southern alternative would have 26.7 trains per day.[35] Thus, the daily emissions of coal dust from the loaded car tops should be 26.7 times 4.79 or 127.9 tons per day. Annually, therefore, emissions for Decker/High Production should be 46,687 tons per year. Compare this to the 168.3 tons/year used in the analysis.[36] The value used in the analysis is 277 times smaller.

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[30] See Chapter 6, p. 6-1.

[31] See Chapter 4, Table 4-19.

[32] http://www.scribd.com/doc/129350651/Surface-TransMinutes-9-10-09-1

[33] See _Introductory_Material.pdf, Table 1, p. S-6.

[34] See Appendix E, Table E.1-1.

[35] See Appendix E, Table E.1-5.

[36] Even if I make the assumption that BNSF's statement to the STB Board in 2009 referred to uncontrolled emissions (i.e., before the use of any load shaping and application of topper agents) and using the BNSF-claimed 85% reduction as a result of these mitigations, I arrive at an annual emissions estimate for the Decker/High Production alternative of 46,687*(1-0.85) or 7003 tons/year – which is over 41 times the value used in the analysis.

This analysis indicates that that the calculated estimates for the coal dust projected to be emitted in the Draft EIS are grossly inaccurate. If the estimated emissions are hundreds of times smaller than what BNSF itself has reported, then the rest of the impact analysis is, plainly, wrong.

Moreover, I note that the Draft EIS estimates for coal dust are riddled with several critical assumptions – none of which are supported or even properly discussed in the Draft EIS. For example:

- On page E-43, the emission factor equation for coal dust used in the analysis is shown. It includes, as an important input variable, the train speed in km/hr. While the Draft EIS "anticipates that average operating speeds would range from 29.7 to 39.5 miles per hour, depending on the build alternative and whether the train is loaded or empty…,"[37] the specific assumed speed(s) used in the calculations for each build alternative/line are not stated further in this section or anywhere else the Draft EIS to the best of our knowledge.

- Again, with regards to the the emission factor equation for coal dust noted above, it is attributed to Connell Hatch 2008, Witt et al. 1999, and Ferreira et al. 2003. As far as I could determine, none of these studies involved PRB coal. In fact, as the Draft EIS explicitly states, "[M]uch of the basis for the coal dust emissions is based on research conducted in Australia by government agencies, academics, and the Australian Rail Track Corporation over the past 10 years."[38] It is therefore unclear why this equation, based on Australian coals, without any further adjustments, is relevant or representative of coal dust emissions from trains and rail cars carrying PRB coal. This is a critical assumption, used without any discussion at all in the analysis.

I understand that BNSF has claimed to be studying coal dust emissions (albeit for ballast related issues and not environmental impacts, per se) for the last decade.[39] Therefore, it is not clear why

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[37] Draft EIS, Chapter 2, Section 2.3.

[38] See Appendix E, p. E-130. See also, discussion in Section E.2.3.1, beginning on p. E-132.

[39] On its website, BNSF states that

> "[S]ince 2005, BNSF has been at the forefront of extensive research regarding the impacts of coal dust escaping from loaded coal cars on rail lines in the Powder River Basin (PRB), which is located in Wyoming and Montana. From these studies, BNSF has determined that coal dust poses a serious threat to the stability of the track structure and the operational integrity of our lines in,

actual data on PRB coals (including properties, dust emissions, etc.) from these BNSF studies themselves were not used in the analysis to estimate the source term in the coal dust analysis. The analysis does not critique the prior BNSF work in order to justify its rejection and use of the Australian-coal based data.

While ignoring any PRB-related data developed by BNSF as a starting point, the analysis freely uses the BNSF-based control efficiency of 85% (a combination of 50% due to coal shaping in the rail car and an additional 70% due to the use of BNSF-approved topper agents) to reduce its estimate of predicted emissions. See Table E.1-42. However, the public record does not contain any details or underlying data as basis for any of these control efficiency assumptions. Other than a brief public summary by BNSF simply reporting the results but none of the underlying data, these critical control efficiency assumptions are not documented anywhere in the Draft EIS.

[B] Coal Dust Emissions Calculations Do Not Include Reentrainment Emissions

In addition to the significant underestimation noted above, the emissions calculations (and later modeling) for coal dust do not seem to account for re-entrainment of coal dust previously deposited trackside or in adjacent right-of-ways.[40] Smaller sized particles including PM10 and fine particulate matter including PM2.5 are readily resuspended when a train passes; thus these emissions should have been included in the emissions calculations. As a result of their omission, the estimated emissions (which are also then used in the modeling analysis) are underestimated. This should be corrected.

[C] Impacts Analyses Contain No Uncertainty Analyses

In Appendix G, neither the human impacts analysis nor the ecological impacts analysis contains a discussion of the uncertainties inherent in these analyses. It is customary to include a discussion of such uncertainties in any health or ecological risk assessment. Given the numerous

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> and close to, the mines in the PRB. The STB, our regulating agency, has confirmed that coal dust is a harmful contaminant of rail ballast. Tests have shown that dusting events from untreated cars occur with the most frequency close to the mine loading points in the PRB and materially decrease as the railcars move further from the PRB."

See http://www.bnsf.com/customers/what-can-i-ship/coal/coal-dust.html.

[40] See Appendix E, Section E.2.1, p. E-131.

assumptions and unknowns associated with human and ecological risk assessments in general, results of such assessments are accompanies by a discussion of uncertainties in order to provide appropriate context to the reader. Without the discussion on uncertainties, readers can often misinterpret the results (i.e., the predicted risks) of such assessments. The Draft EIS should therefore include such uncertainty analyses.

[D] Estimation of Trace Element Concentrations in Coal Dust Are Improper

In Appendix G, Section G.2.1, the Draft EIS states that:

> "OEA included in the exposure assessment each of the trace elements that had measured values in the composite data. To obtain a single concentration value for each trace element, OEA averaged the concentrations of each chemical in each workbook. Then, if the element was reported in both workbooks, OEA averaged the two averages into an overall average concentration (Table G-1)."

The Draft EIS should disclose why the STB used averaging (or even double averaging, as discussed above) instead of the more customary use of maximum values, particularly given the "screening" nature of the overall assessment and the fact that the underlying coal properties database is not discussed other than the results were from 2004.[41] The Appendix does not discuss where the samples originated from (i.e., from just the Otter Creek Mine area, the other mines that could also be developed as a result of this project, or elsewhere); how the samples were obtained; or how representative the samples were in relation to the coal seams at the likely mines.

In view of these many questions, it is improper to simply use averages as the starting point of the analysis. Gven the fundamental flaw in this basic input, none of the subsequent "results" of the analysis, both for human as well as ecological impacts, are reliable.

[E] Composition of Most of the Topper Agents is Unknown

It is clear from the discussion of the topper agents in Appendix G that much is unknown as far as the composition of almost all of the "approved" agents. For example, the Draft EIS states:

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[41] See Appendix G, p. G-2.

> "The MSDS include wide ranges for the concentrations of some the constituents (e.g., 5 to 50 percent). In other cases, the MSDS identify some constituents as "proprietary" and provide no further information."[42]
>
> "Given that the actual chain length is not specified, the environmental fate of this topper agent is uncertain."[43]
>
> "The purpose of Soil-Sement® is to bind to soils, making it likely that the copolymer of acrylic and polyvinyl acetate will preferentially bind to soils, although given the limited information available on the composition of the product and mobility characteristics of the constituents, this is uncertain."[44]
>
> "The MSDS for AKJ CTS-100 does not provide information on ecotoxicity or chronic impacts…..The MSDS does not describe the environmental mobility of the product in air, water, and soil/sediment, but the MSDS notes that accidentally released product should not be flushed into sewers."[45]
>
> "The MSDS does not describe the environmental mobility of AKJ CTS-100C in air, water, and soil/sediment, nor does it provide information on ecotoxicity."[46]
>
> "No additional information is provided in the MSDS on the chemical components in Min Topper S+0150."[47]

Given this level of lack of knowledge of these topper agents, it is not clear why the present "analysis" is, in fact, useful at all. Unless the STB can obtain meaningful data on the constituents in these agents, it has no basis to present is findings as some sort of impact analysis. Coupled with the lack of any uncertainty analyses as noted earlier, the entire analysis is misleading and unreliable.

[F] Additional Assumptions Relating to Topper Agent Emissions are Unsupported

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[42] See Appendix G, p. G-4.

[43] See Appendix G, p. G-6. Pertaining to Nalco Dustbind Plus.

[44] See Appendix G, p. G-7. Pertaining to Midwest Soil-Sement.

[45] See Appendix G, p. G-7. Pertaining to AKJ CTS-100. In addition, this topper agent contains an unknown proprietary addition (See Table G-2).

[46] See Appendix G, p. G-8. Pertaining to AKJ CTS-100C. In addition, this topper agent contains an unknown proprietary addition (See Table G-2).

[47] See Appendix G, p. G-9. Pertaining to Mintech Min Topper S+0150. In fact, nothing useful is known about this topper agent (See Table G-2).

Continuing further, the Draft EIS states that:

> "Assuming a railcar is 480 square feet in surface area or 4,603 cubic feet in volume (BNSF Railway Company 2013) and assuming that the topper agent penetrates the top 4 inches of the coal in the railcar, the topper agent would penetrate 160 cubic feet of coal, corresponding to approximately 3.5 percent of the coal in the railcar."[48]

This statement raises numerous questions that are not addressed in the Draft EIS, including the following:

> What is the basis of the surface area of each railcar as noted above?
>
> Are all railcars assumed to have the same surface area?
>
> What is the basis of the volume of each railcar as noted above?
>
> Are all railcars assumed to have the same volume?
>
> What is the basis for assuming that any of the topper agents "penetrates the top 4 inches of the coal" as assumed above?
>
> What is the basis for assuming that any of the topper agents fully covers the <u>entire</u> exposed surface area of <u>each</u> railcar in an unit train?

Without addressing these questions with further detailed discussion of how these agents are actually applied in practice, the various assumptions above are unsupported.

[G] Coal Deposition Modeling is Fatally Compromised

With regards to coal dust deposition modeling, the Draft EIS states that:

> "OEA modeled wet, dry, and total coal dust deposition rates based on estimated rail car coal dust emissions, adjusted for the use of load profiling and topper agents for coal dust emission reduction. OEA estimated deposition rates at 10-meter intervals from the center of the rail line to a distance of 300 meters on each

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[48] See Appendix G, p. G-9.

> side of the rail line, or 60 locations (receptors). OEA evaluated particle size categories of less than 60 microns in diameter, 60 to 250 microns in diameter, and the sum of the two (i.e., all particles up to 250 microns in diameter)."[49]

It is not at all clear why the Draft EIS included as its smallest size fraction, particle size of "less than 60 microns in diameter." It is obvious that the particle sizes of concern include much smaller sizes such as PM10 and PM2.5 (for which there are NAAQS) and which are capable for being inhaled, resulting in adverse health outcomes. It is also clear that these much smaller size particles could travel much father than the assumed 300 meters distance on each side of the rail line. Unless the STB can demonstrate that none of the (very friable PRB coal dust) particles are or can be less than 10 microns or 2.5 microns, simply assuming that even the smallest particles will not travel beyond 300 meters is an unsupported assumption. Thus, I believe that the results of these deposition modeling are unreliable and should be set aside.

[49] See Appendix G, p. G-11.

Conclusions

As discussed in detail in these comments, the Draft EIS contains significant deficiencies in both the air quality and the coal dust emissions analyses.

A major and unexplained flaw that affects both sections is the apparent significant underestimation of coal dust emissions from railcars. The coal dust emissions estimates provided in the Draft EIS – relying on Australian work with no discussion as to relevance to the PRB coals that will be transported – do not approach the levels of emissions publicly stated by BNSF, the operator of the proposed project in statements to the STB. Also, the coal dust emissions estimates omit assessment of re-entrainment emissions of dust previously deposited. Since the coal dust emissions estimates are foundational inputs that feed into the air quality analyses, the results of all the air quality analyses that rely on these vastly underestimated coal dust emissions are also therefore underestimated and cannot be relied upon.

As discussed above, the air quality analysis is significantly compromised in other aspects as well, including the following: it suffers from a lack of transparency with no support for numerous assumptions including the use of the IPM Model; it improperly relies on improper and unsupported Board thresholds to censor the analysis at the outset; it does not distinguish between the Tribe's Class I area and its need for special protections versus other impacted areas; and it improperly relies on the NAAQS and MAAQS as the only appropriate comparison standards.

Based on this review, I conclude that the coal dust and air quality emissions assessments in the Tongue River Railroad Draft EIS are deeply flawed and fail to provide a reliable evaluation of the potential environmental and human health impacts from emissions of coal dust and other air pollutants.

ATTACHMENT A - RESUME

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CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

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EXPERIENCE SUMMARY

Dr. Sahu has over twenty three years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over twenty one years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty three years include various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including EPA, the US Dept. of Justice, California DTSC, various municipalities, etc.). Dr. Sahu has performed projects in over 44 states, numerous local jurisdictions and internationally.

In addition to consulting, Dr. Sahu has taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management) for the past seventeen years. In this time period he has also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.) public sector (such as the US Department of Justice) and

public interest group clients with project management, air quality consulting, waste remediation and management consulting, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, Caltech, Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992-present.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-present.

Air and Waste Management Association, West Coast Section, 1989-present.

PROFESSIONAL CERTIFICATIONS

EIT, California (# XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2011.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C.Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R.Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Puchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

"The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants," with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

1. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

(a) In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

2. Matters for which Dr. Sahu has have provided affidavits and expert reports include:

(b) Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

(c) Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

(d) Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

(e) Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).

(f) Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).

(g) Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

(h) Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (Eastern District of Kentucky).

(i) Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

(j) Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

(k) Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

(l) Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

(m) Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

(n) Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

(o) Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

(p) Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

(q) Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

(r) Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with General Power Products, LLC v MTD Products Inc., 1:06 CVA 0143 (Southern District of Ohio, Western Division)

(s) Experts Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

(t) Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

(u) Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

(v) Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy et al., v Duke Energy Carolinas, LLC. in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

(w) Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.

(x) Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.

(y) Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas.

(z) Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

(aa) Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina).

(bb) Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

(cc) Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(dd) Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(ee) Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(ff) Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(gg) Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(hh) Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

(ii) Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (US District Court for the Eastern District of Michigan).

(jj) Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

(kk) Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(ll) Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(mm) Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(nn) Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of Plaintiffs v. Public Service Company of New Mexico (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE). (US District Court for the District of New Mexico).

(oo) Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(pp) Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(qq) Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Case No. 5:10-cv-00156-DF-CMC (US District Court for the Eastern District of Texas, Texarkana Division).

(rr) Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(ss) Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

(tt) Expert Report (March 2011), Rebuttal Expert Report (Jue 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(uu) Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority,* Civil Action No. 4:11-cv-00791 (US District Court for the Southern District of Texas, Houston Division).

(vv) Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(ww) Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(xx) Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.,* Civil Action No. A-08-CA-648-LY (US District Court for the Western District of Texas, Austin Division).

(yy) Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.,* Case No. 3:10-cv-747 (TJM/DEP) (US District Court for the Northern District of New York).

(zz) Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association,* Case No. 11-417-MJP (US District Court for the Western District of Washington).

(aaa) Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(bbb) Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency,* Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

(ccc) Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

(ddd) Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality,* Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

(eee) Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.,* Civil Action No. 07-CV-5298 (JKG) (US District Court for the Eastern District of Pennsylvania).

(fff) Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project

(ggg) Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

(hhh) Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

(iii) Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.

(jjj) Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

(kkk) Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.

(lll) Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

(mmm) Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.

(nnn) Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(ooo) Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

(ppp) Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of A. J. Acosta Company, Inc., v. County of San Bernardino, Case No. CIVSS803651.

(qqq) Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

(rrr) Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.

(sss) Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

(ttt) Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.

(uuu) Expert Report (January 2014) on behalf of Baja, Inc., in Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).

(vvv) Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States, Civil Action No. 13-1820 RC (United States District Court for the District of Columbia).

(www) Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).

(xxx) Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

(yyy) Declaration (July 2014) on behalf of Public Health Intervenors in the matter of EME Homer City Generation v. US EPA (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).

3. Occasions where Dr. Sahu has provided oral testimony <u>in depositions, at trial or in similar proceedings</u> include the following:

(zzz) Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.

(aaaa) Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

(bbbb) Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

(cccc) Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

(dddd) Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et* al. *v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).

(eeee) Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.

(ffff) Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.

(gggg) Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.

(hhhh) Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.

(iiii) Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.

(jjjj) Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(kkkk) Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al*.

(llll) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(mmmm) Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(nnnn) Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(oooo) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

(pppp) Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(qqqq) Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(rrrr) Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(ssss) Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(tttt) Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

(uuuu) Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(vvvv) Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(wwww) Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(xxxx) Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(yyyy) Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(zzzz) Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(aaaaa) Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(bbbbb) Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(ccccc) Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(ddddd) Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of

Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(eeeee) Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(fffff) Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(ggggg) Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

(hhhhh) Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

(iiiii) Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(jjjjj) Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

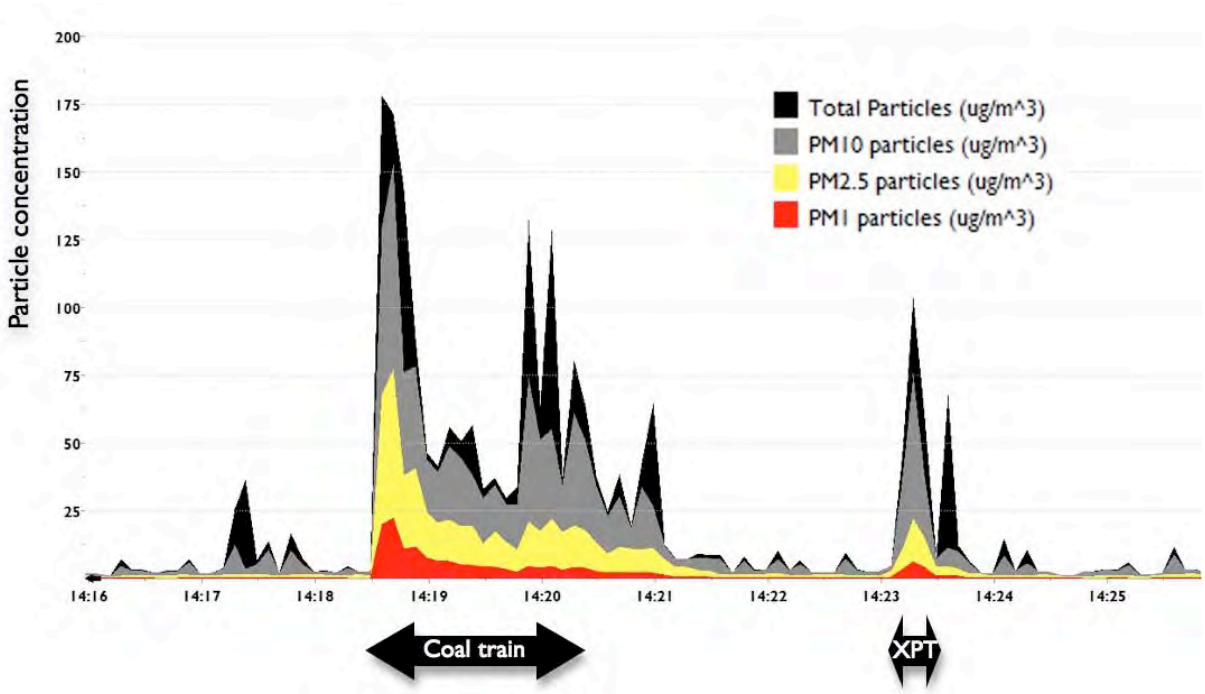
(kkkkk) Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

(lllll) Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(mmmmm) Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(nnnnn) Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

Coal Train Pollution Signature Study



A briefing paper prepared by Associate Professor Nick Higginbotham,
Dr Ben Ewald, Ms Fee Mozeley and Dr James Whelan,

for the Coal Terminal Action Group Dust and Health Committee.

August 2013

About the Coal Terminal Action Group

An alliance of Newcastle and Hunter Valley community groups including: *The Australian Coal Alliance, Australian Youth Climate Coalition, the Barrington Gloucester Stroud Preservation Alliance, Climate Action Newcastle, Correct Planning and Consultation for Mayfield Group, Gloucester Residents in Partnership, the Green Corridor Coalition, Hunter Bird Observers Club, Hunter Community Environment Centre, Hunter Communities Network, Hunter Environment Lobby, Islington Village Community Group, the National Parks Association (Hunter Branch), the Nature Conservation Council of NSW, Parks and Playgrounds Movement, Rising Tide Newcastle, Singleton Shire Healthy Environment Group, Stockton Community Action Group, Tighes Hill Community Group, and the Wilderness Society Newcastle Branch.*

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- CTAG's Dust and Health Committee.
- The twenty volunteers who assisted with the monitoring.
- More than 100 community members who donated to make this study possible.

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Glossary

$\mu g/m^3$	micrograms per cubic metre
µm	microns (one millionth of a metre)
Entrainment	time taken for particle pollution levels to return to pre-train background levels
km	kilometre
km/hr	kilometre per hour
m	metre
m/s	metres per second
Mtpa	million tonnes per annum
NE	northeast
NW	northwest
PM_{10}	Particulate matter with a diameter of 10 micrometres or less
$PM_{2.5}$	Particulate matter with a diameter of 2.5 micrometres or less
PM_1	Particulate matter with a diameter 1 micrometre or less
SE	southeast
SW	southwest
TSP	Total suspended particulates (with a diameter 50 micrometres or less)

Acronyms

ARTC	Australian Rail Track Corporation Ltd
BoM	Bureau of Meteorology
EPA	NSW Environmental Protection Authority
PRP	Pollution Reduction Program
OEH	NSW Office of Environment and Heritage

Executive summary

Community groups in Newcastle and the Hunter consider coal dust a significant health problem. With more than 100 coal trains passing through residential areas each day, residents have become increasingly informed about the impacts of pollution from uncovered coal wagons, and supportive of measures to reduce this pollution.

Between Monday 15 July and Wednesday 17 July, members of several community groups monitored particle pollution levels in residential areas of Beresfield, Sandgate and Mayfield. With expert advice and assistance, we monitored particle pollution concentrations while 73 loaded and unloaded coal trains passed. The Osiris equipment utilised for the study allowed for concurrent monitoring of various particle sizes: PM_1 and $PM_{2.5}$ that are associated with combustion (e.g. train locomotives) and the larger PM_{10} particles, which are indicative of coal.

The study was an initiative of the Dust and Health Committee of the Coal Terminal Action Group, an alliance of twenty community and environment groups representing residents throughout Newcastle and the Hunter Valley. The study aimed to answer two research questions:

1. What is the particulate profile (signature) of loaded and unloaded coal trains?
2. What is the increase in particulate matter associated with the passage of loaded and unloaded coal trains, measured by comparing to pre-train particle concentrations)? Is the proportion of increase the same across all particulate fractions (PM_{10}, $PM_{2.5}$ and PM_1)?

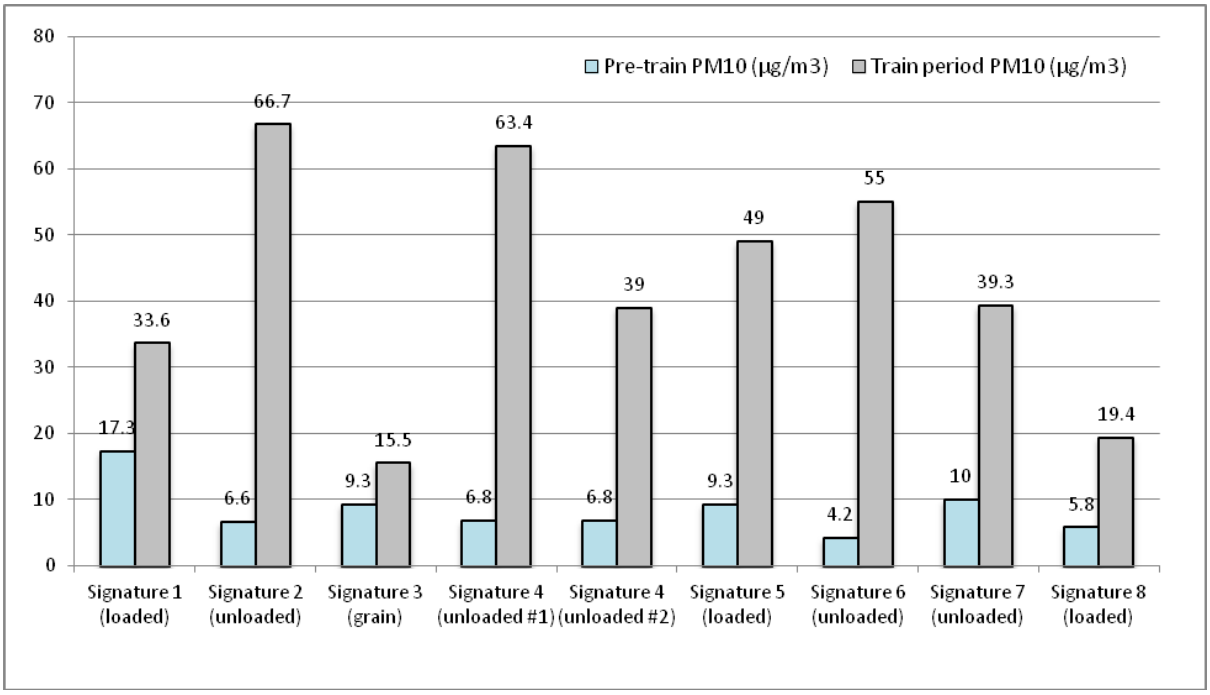
The study was the first of its kind in Australia. Crowd-funded by more than 100 donors, the study was entirely designed and conducted by members of community groups. They were advised and assisted by experts and academics and utilised industry-standard equipment. The results of the study were analysed by public health researchers.

In June 2013, before this study commenced, community members were shocked to learn that an industry study of the particle pollution caused by coal trains had been dramatically modified at the last moment to reverse many of its conclusions and understate the amount of pollution caused by coal trains. Unlike that study, our investigation was not designed to differentiate between train types. It deliberately focused on loaded and unloaded coal trains.

A total of 73 coal trains were observed during the three days of monitoring. The corresponding pollution data was analysed to generate 'signatures' which depict particle concentrations before, and during the trains' pass by. The method compares a two-minute average pollution level before each train to a two-minute average while the trains were passing by the monitoring equipment. Eight signatures are examined in this study. These signatures were selected to demonstrate an indicative range of signatures under various conditions (wind direction, wind speed, train speed, train type etc).

The following chart shows an analysis of particulate concentrations (PM_{10}) associated with each of the 8 signatures. It compares 2 minutes of pre-train air quality with 2 minutes of particulate matter concentrations produced during the train passage (i.e., the signature). All graphs show coal trains, apart from Signature 3, which is a grain freight train.

Chart 1: Particulate concentrations (PM_{10}) associated with train signatures



All coal train signatures were associated with a significant increase in PM_{10} particle pollution levels. In the case of Signatures 1 and 5, this represents increases of 94% and 427% respectively for loaded coal trains. Signature 6 increased PM_{10} concentrations significantly, up to 1210%. In sum, coal trains increase PM_{10} levels by between 94% and 1210%. While coal trains pass, particle pollution concentrations increase up to 13 times pre-coal train levels.

While the study was not intended to compare different types of trains, a number of freight and passenger trains were captured in our signature measurements. We noted city link trains did not produce a definable signature, while freight trains and the XPT did show signatures in some cases, but they were much smaller in comparison to those observed for coal trains, and of shorter duration.

The results of this study warrant decisive action by the New South Wales Government. The Coal Terminal Action Group commends this study to Premier Barry O'Farrell and call on the NSW Government to:

1. Direct the state's coal industry to cover and wash all loaded and unloaded coal wagons
2. Suspend assessment of the proposed fourth coal terminal (T4)
3. Commission an independent assessment of the health impacts of particle pollution in the Hunter to assess the social and economic impacts of current particle concentrations and model the impacts of the proposed fourth coal terminal (T4).

1. Background

This study was initiated and managed by the Coal Terminal Action Group's Dust and Health Committee. The committee was established in August 2012 to respond to widespread concern that Newcastle and other 'coal corridor' communities are exposed to elevated levels of fine particle pollution. Exposure is known to cause a range of serious short-term and long-term health impacts and can occur when peak exposures of short duration (ranging from less than an hour up to a few hours) lead to immediate physiological changes.[1]

The coal export capacity for the Port of Newcastle has grown exponentially in recent years, from 77 million tonnes per annum (Mtpa) in 1997 to 210Mtpa in 2012. The Fourth Newcastle Coal Loader (T4) proposal by Port Waratah Coal Services (PWCS) would see this increase to 330Mtpa, resulting in approximately 107 more train movements each day.[2]

NSW Health has cautioned against the development of T4 due to the impacts of existing pollution levels and the modelled increases in coal dust during its construction and operation.[3] However, the coal industry and NSW Environment Protection Authority (EPA) refute these health concerns, alleging that coal trains are not a significant source of fine particle pollution (nor different from other types of trains in terms of pollution) and that particle pollution diminishes rapidly with distance from the coal corridor. These assertions are not supported by scientific evidence.

This is CTAG's second pollution monitoring study. In late 2012, CTAG conducted air quality monitoring at twelve suburban locations to provide a snapshot of current levels of particle pollution. The alliance hired industry-standard 'Osiris' equipment to monitor particles of up to ten microns in diameter (PM_{10}) and fine particles of up to 2.5 microns and 1 micron in diameter ($PM_{2.5}$ and PM_1) in residential areas between 5 December 2012 and 5 January 2013. The study program was assisted and results analysed by air quality scientists Associate Professor Howard Bridgman and Dr Jill Sweeney of the University of Newcastle.

The results of our first study were alarming. The national standard for PM_{10} is 50 micrograms per cubic metre ($\mu g/m^3$) averaged over a 24-hour period (measured using a TEOM monitoring device). This standard was exceeded at seven locations. At some locations, we recorded levels more than 50% higher than the national standard, and the standard was exceeded as often as every day. These findings suggest that residents living within 500 metres of coal trains and stockpiles are experiencing particle pollution at harmful levels. More than 30,000 people reside and 25,000 children attend school within 500 metres of the coal corridor between Rutherford and the Newcastle Port.

Building on our initial snapshot study, we embarked on a second round of air pollution monitoring to provide the community with data on PM_{10}, $PM_{2.5}$ and PM_1 'signatures' of coal trains. Such signatures show the profile of particulate pollution when repeated measurements are taken during the period when the coal train passes by. This profile reveals the upward development to the peak particulate concentrations, as well as the entrainment of suspended particulates after the train has passed, until they diminish to pre-train levels.

This second snapshot study has been designed to serve as a pilot for a larger investigation into particulate emissions from coal trains.

2. Health Impacts of Air Pollution

According to the Australian Medical Association, air pollution kills more people each year in Australia than car crashes. Fine particles of ten microns or less in diameter (PM_{10}) and 2.5 microns or less in diameter ($PM_{2.5}$) are readily inhaled, causing asthma attacks, hospitalisation, reduced activity days and premature death.[4] The Australian Medical Association's President Dr Steve Hambleton recently observed that the Newcastle community already experiences high levels of pollution: "It's an especially at-risk population where we know there's already increased rates of respiratory illness."[5]

According to the NSWEPA, mining and transportation of coal contribute 87.6% of the Hunter Valley's PM_{10} and 66% of the Hunter's $PM_{2.5}$.[6] During 2012, the network of 17 Hunter Valley monitoring stations recorded levels of PM_{10} levels over the national standard on 115 occasions. A Senate Committee examining the health impacts of air pollution conducted a hearing Newcastle on 16 April 2013. Many of the 150 submissions received by the Committee came from residents and community groups in the Hunter. Senators were urged to reduce air pollution by groups including the Clean Air Society of Australia and New Zealand, the CSIRO and the Australian Medical Association.[7]

There is a high level of concern about the health impacts of coal rail dust along Hunter Valley coal rail lines. For decades, residents along the coal corridor have complained about coal dust and its health impacts. On 16 March this year, 1,500 residents rallied to express these concerns and oppose a proposed fourth coal terminal.

3. Objectives

The Dust and Health Committee aims to provide the community with independent information and advice upon which to consider the T4 proposal and other port development projects. The objective of this study was to provide the community with information about the pollutions 'signatures' of coal trains. Pollution signatures show the level of PM_{10}, $PM_{2.5}$ and PM_1 when multiple measurements are taken during the period when a coal train passes by a monitoring point. This profile reveals the upward development to the peak particulate concentrations, as well as the 'entrainment' of suspended particulates after the train has passed, until they diminish to pre-train levels.

4. Method

4.1 Research Questions

1. What is the particulate profile (signature) of a coal train pass-by (loaded and unloaded) as measured by concentrations of PM_{10}, $PM_{2.5}$ and PM_1?

2. What is the increase in particulate matter associated with the passage of loaded and unloaded coal trains, measured by comparing two minutes averages, starting three minutes before the train arrives, two minutes averages starting 30 seconds after the train arrives? Is the proportion of increase the same across all particulate fractions (i.e., PM_{10} vs $PM_{2.5}$ vs PM_1)?

4.2 Site selection

Criteria for selecting monitoring sites

- Proximity to frequent coal train movements
- Proximity to residential areas
- Sites close to and on downwind side of tracks for optimum capture of PM fraction
- Ability to respond to wind and weather conditions
- Clear of environmental interferences such as trees, houses, localised sources of PM and
- Access to power sources and security.

Selected monitoring sites

- Beresfield train station
- Hexham – near the Shamrock Street crossing
- Waratah train station
- Upfold Street Mayfield

A map showing these four locations is available online here > https://www.google.com/maps/ms?msid=210722871585608627393.0004de7533379370e3362&msa=0

Further monitoring requirements

- Calibration at EPA's TOEM monitoring site at Francis Greenway High School, Beresfield
- Log keeping capturing variables - particularly train movements and also non-target events to help explain changes in PM levels.

4.3 Monitoring duration and techniques

The monitoring equipment was positioned according to the manufacturers' specifications. Mike Fry, the Managing Director of Turnkey Instruments Pty Ltd that hires this equipment to industry and government throughout Australia, oversaw all aspects related to the setting up the monitors and data management. Monitors were set up downwind of the coal tracks to capture emissions from rail trains.

To address the research questions, the monitoring was conducted as close to coal track lines as possible and the monitor was kept in place as long as practicable to capture background air levels and concentrations of particulate pollution specifically from loaded and unloaded coal train movements.

Volunteers received training and supervision in recording log information about the train pass-bys.

Estimating train speed

Train speed was calculated with a stopwatch. The time taken for the passing of 10 cars was recorded and then used to analyse the approximate train speed. Time keepers were reminded that the starting point is gap zero, not car one. Time keepers were instructed to look across the train to the landscape behind (flashes visible in the space between cars) and to choose a flash to start the watch, and count "zero", 1, 2 etc and stop the watch at 10.

Research team tasks

The monitoring required three researchers. Two researchers logged the train detail on a recording sheet. The third researcher assisted Mike Fry to ensure that the monitor was functioning during the pass-by recording, and noted any anomalous readings. These were noted and any immediate sources identified, if present. This researcher also noted the imminent arrival of a second train passing by when that occurred, so the person logging recorded its passage accurately.

Log sheets recorded start time, stop time, type of train (loaded coal, unloaded coal, freight, passenger), number of locomotives, number of wagons or carriages, train code and company, time for 10 carriages to pass, and multiple or single pass-by.

4.4 Equipment

Osiris air quality monitors were hired from Turnkey Instruments. These instruments are capable of simultaneously measuring Total Suspended Particles (TSP), PM_{10}, $PM_{2.5}$ and PM_1 particulates. The equipment can be set to monitor every one second or every ten seconds with the results saved to memory or immediately transmitted in selected timing averages. Once down-loaded, the stored data was then interpreted using the AirQ32 software which generates trending graphs, tables, and wind inputs. These can also be represented as a pollution rose to indicate the wind direction that the particulates travelled from towards the sampling location at the time of measurement.

4.5 Review Process

Our analysis and conclusions were independently reviewed by Associate Professor Howard Bridgman, one of Australia's leading air quality experts and editor of the Clean Air Society of Australia and New Zealand journal. Independent review was considered of utmost importance following the controversial Australian Rail Track Corporation report published in June 2013. Two weeks after the ARTC report was published, and after the NSW EPA announced their policy response to the report, an independent review by Dr Luke Knibbs of the University of Queensland highlighted fundamental flaws in the study and its analysis.

5. Data analysis and findings

5.1 Osiris versus TEOM

Before undertaking trackside monitoring the Osiris air monitors were positioned next to the permanent EPA monitor at Beresfield on Monday 15 July and set to record 1 minute averages of PM_{10} and $PM_{2.5}$, as these are the parameters recorded by the EPA TEOM device that is regarded as industry standard. This was done for 29 minutes to calibrate the Osiris instrument to the EPA's monitoring of background particle concentrations.

µg/m^3	TEOM PM_{10}	Osiris PM_{10}	TEOM $PM_{2.5}$	Osiris $PM_{2.5}$
Average	19.910	11.417	13.356	5.307
Standard deviation	3.322	1.742	1.462	0.401

The correlation between Osiris readings and TEOM for PM_{10} was r=0.676, and for $PM_{2.5}$ was r=0.838, showing that the readings are fairly highly correlated, and that Osiris readings were lower for PM_{10} by about 40% and for $PM_{2.5}$ by about 60%. Regression of Osiris against TEOM showed that for PM_{10} TEOM = 5.2 + Osiris x 1.28 and for $PM_{2.5}$ TEOM = -2.87 + Osiris x 3.06.

5.2 Location specifications

For the remainder of the day on Monday 15 July, the Osiris monitor was then mounted 0.8m from the fenced perimeter of the railway corridor at Beresfield. Weather conditions were partly cloudy, mostly dry, with light intermittent wind from the north-west, average wind speed 0.2m/s. The Osiris was run from a small portable generator on a 15m extension lead, which was positioned to the south west, downwind from the monitor. The distances to the rail tracks were 8.6m, 12.3m, 17.3m and 23.0m from the mid-line of the tracks for the coal outbound, coal inbound, passenger outbound and passenger inbound lines respectively. Empty coal trains travelled on the nearest track, and full coal trains on the second nearest track.

On Tuesday 16 July, the Osiris monitor was mounted 0.5m from the fenced perimeter of the railway corridor at Hexham near the Shamrock Street crossing. Weather conditions were partly cloudy in the morning becoming sunny as the day progressed. Conditions were dry. The average wind speed was 1.3m/s with the 75th percentile of wind speed registering 2m/s with a maximum wind speed of 5m/s. The Osiris was run from a small portable generator on a 15m extension lead, which was positioned to the east-northeast, downwind from the monitor. The monitor was located 12m from the inbound coal track and 9m from the inbound passenger train track. The distances to the rail tracks were 27.6m, 23.3m, 19.3m and 15.0m from the mid-line of the tracks for the unloaded coal outbound, loaded coal inbound, passenger outbound and passenger inbound lines respectively.

On Wednesday 17 July, the Osiris monitor was again mounted 0.8m from the fenced perimeter of the railway corridor at Beresfield. Weather conditions were sunny and dry, with light intermittent wind from the NW, with an average wind speed 1.02m/s. Location details including distances from the track were the same as Monday 15 July (see above).

5.3 Data Analysis and Findings

Pollution Signatures

Two technical observers independently assessed graphics of each train pass-by to assess whether it produced a distinguishable signature. Signatures were confirmed for trains that measured a clear rise in particulate concentrations (TSP, PM_{10}, $PM_{2.5}$ and PM_1) compared to the background air prior to and after the train pass-by. Both assessors agreed that more than 80% of coal trains (loaded and unloaded) showed distinguishable increases. A small number of coal trains produced a less pronounced signature, and it was increases in $PM_{2.5}$ that became a defining indicator.

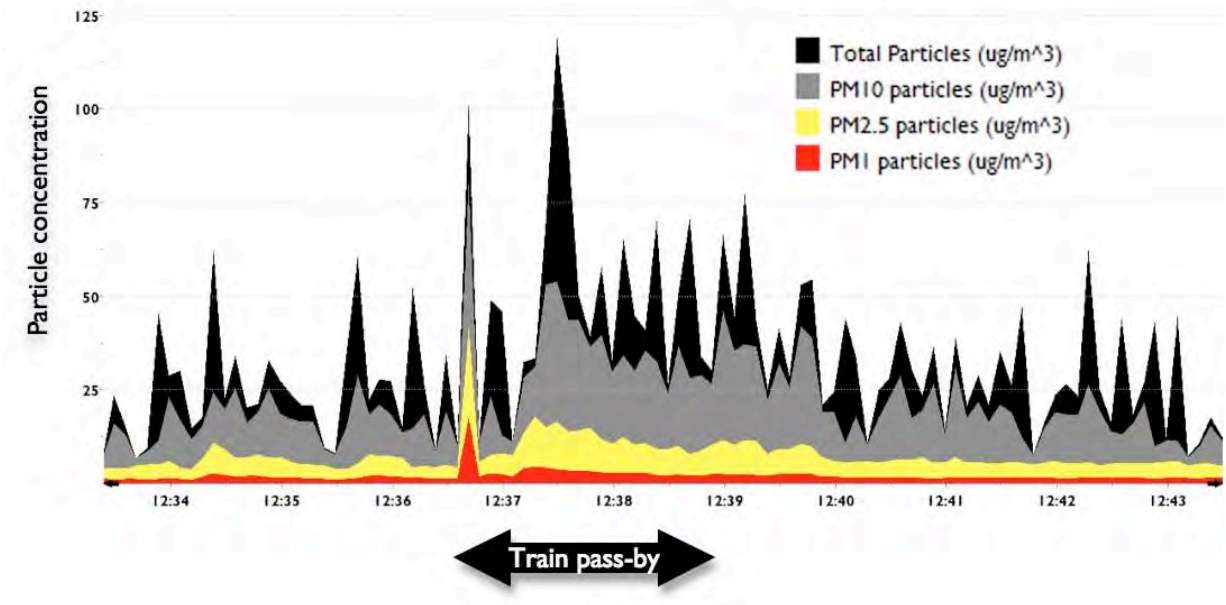
Table 1. Comparison of coal trains producing distinguishable and indistinguishable pollution signatures.

Discernible Signature	Loaded	Unloaded	Total
Yes	26 (72%)	31 (94%)	57 (81%)
No	10 (28%)	3 (6%)	13 (19%)
Totals	36	33	70 (100%)

Note: Further analysis will be undertaken to understand the significance of non-signature producing trains.

The following eight graphs provide an indication of the nature and possible determinants of train pollution signatures.

Figure 1. Signature 1 - Loaded Coal Train Monday 12:36pm



Signature 1 shows a characteristic loaded coal train (3 locomotives and 100 wagons) signature during monitoring. The train pass-by coincided with a brief wind blast of 3.6km/hr that was preceded and followed by relative stillness. The train slowed upon arrival to pass at an average of 42km/hr.

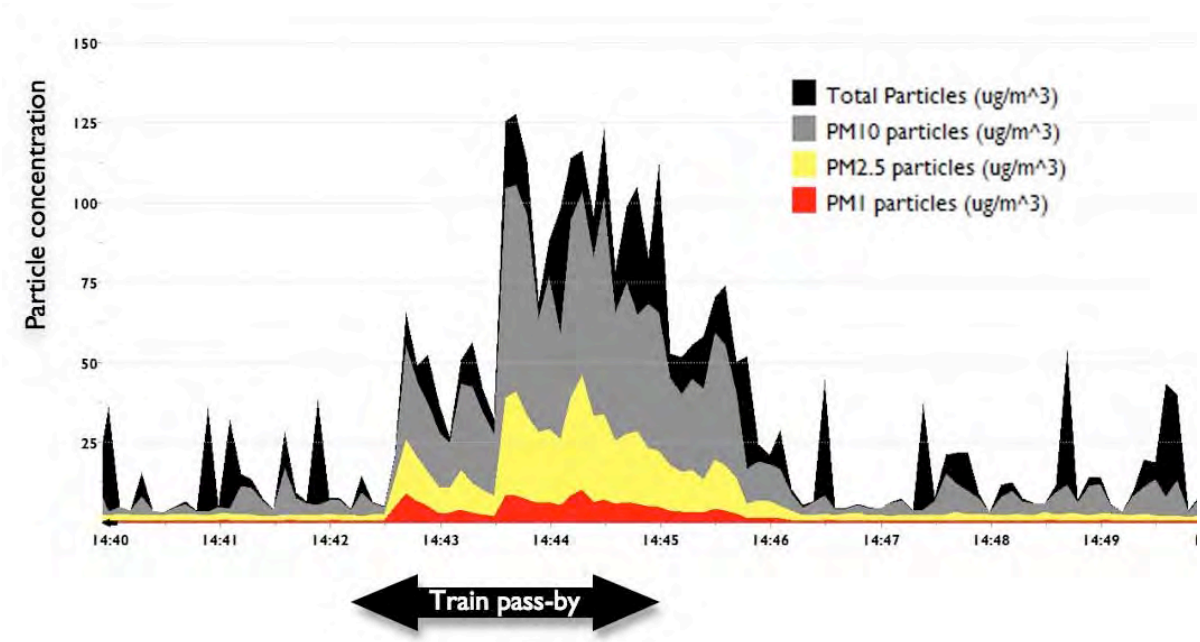
The loaded coal train produced a sharp rise in concentrations of all particulate sizes and produced an entrainment that lasted more than four minutes. This signature stands out against background track air that had residual pollution from an earlier train that had passed by less than two minutes prior.

The short burst of PM_1, $PM_{2.5}$ and PM_{10} at the onset of the pass by is remarkable. The high ratio of PM_1 to TSP indicates diesel emissions and is positively correlated with the logged observations that noted that this train was producing 'heavy smoke' from the locomotives.

This signature shows continuing high proportions of PM_{10} to TSP, with a gradual decline in $PM_{2.5}$, and a slow return to pre-train background levels. PM_{10} was 33.6µg/m^3 averaged over two minutes and pre-train background PM_{10} levels were 17.3µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 1.	17.3µg/m^3	33.6µg/m^3	16.3µg/m^3

Figure 2. Signature 2 - Unloaded Coal Train Monday 14:42pm

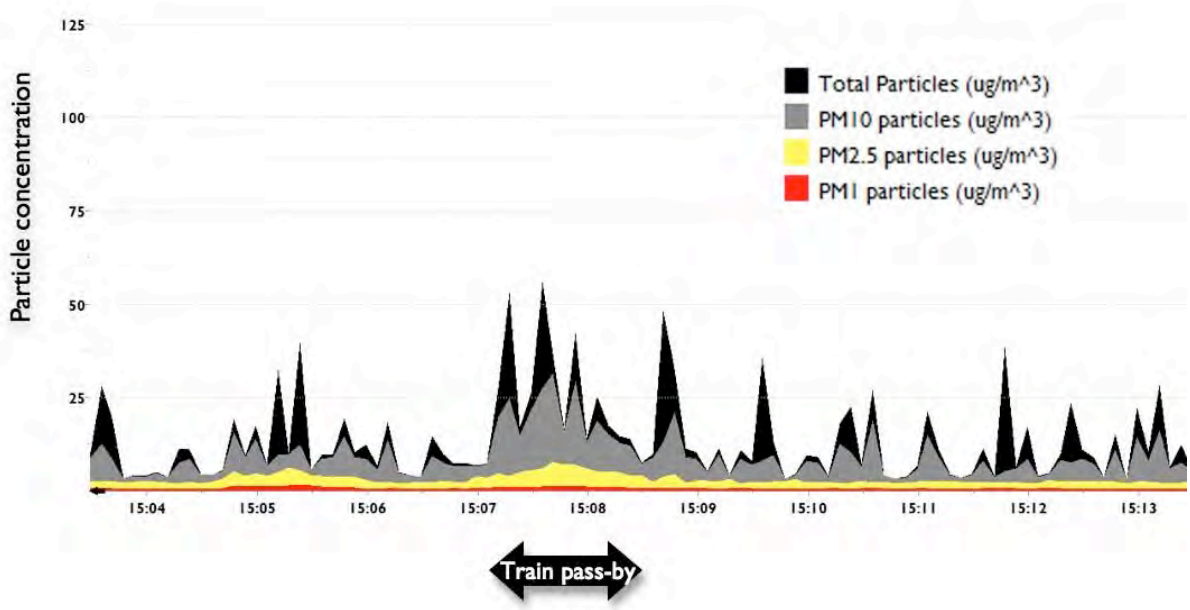


Signature 2 is indicative of an unloaded coal train pass-by. The track for this unloaded coal train was the closest to the Osiris monitor. Unloaded coal trains generally approached the monitor at higher speeds than loaded coal trains. This unloaded coal train (with 3 locomotives and 98 wagons) slowed to an average speed of 35km/hr. The wind was moving at 0.13km/hr and turned from N to the direction of the train, which was SE/SSE during the pass-by.

This signature shows two initial spikes in particulate matter with a one minute delay and then a third, larger and more sustained pollution plume. Signature shows a strong indication of diesel emissions (PM_1) and strong $PM_{2.5}$ levels accompanying the high levels of PM_{10}. The two-minute average of PM_{10} was 66.7µg/m^3 compared to the two minute average pre-train level of 6.6µg/m^3. An entrainment of more than four minutes is noted.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 2.	6.6µg/m^3	66.7µg/m^3	60.1µg/m^3

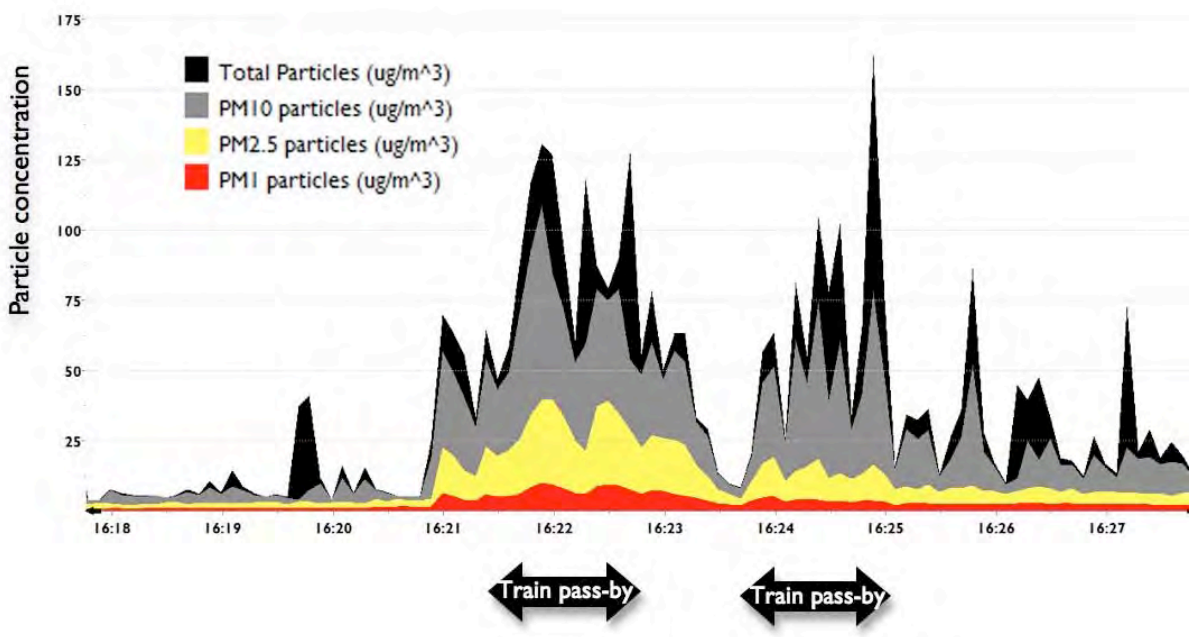
Figure 3. Signature 3 – Grain Train Monday 15:07pm



Signature 3 represents the affects of a freight train carrying grain. This AWB grain train (with 4 locomotives and 36 enclosed wagons) was travelling on the track closest to monitor. The train was moving at an average speed of 31km/hr. The air was still and the blast of air that accompanied the train changed the wind direction from NNE to SE during the pass-by. It gives a modest signature against the background, with two-minute average PM_{10} levels of 15.5µg/m^3 and average pre-train background levels of 9.3µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 3.	9.3µg/m^3	15.5µg/m^3	6.2 µg/m^3

Figure 4. Signature 4 – Multiple Unloaded Coal Trains Monday 16:21pm

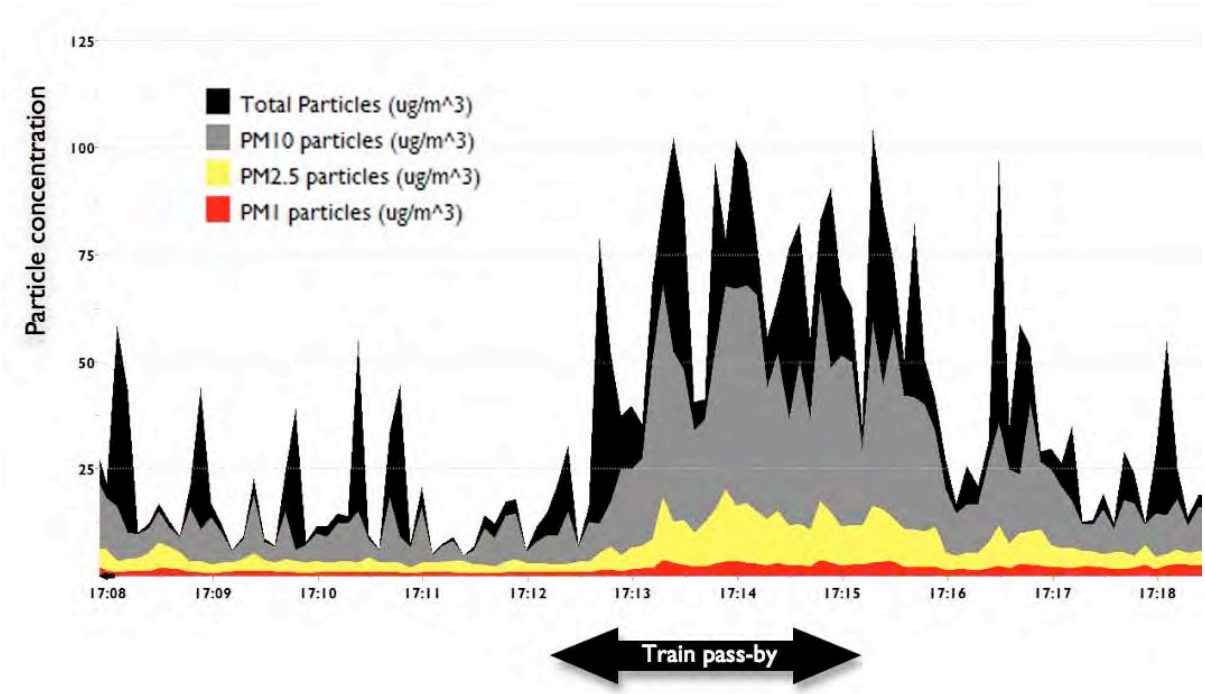


Signature 4 captures two back-to-back unloaded coal trains. The first unloaded coal train (3 locomotives and 104 wagons) approached at 69km/hr and then slowed to an average speed of 40km/hr. The second unloaded coal train (2 locomotives and 72 wagons) passed by at a constant speed of 67-68km/hr. The combination of the two trains generated their own wind, increasing from 1.9 to 4.3km/hr (ESE).

The signature shows high levels of TSP containing PM_{10} and high initial levels of $PM_{2.5}$ that is slow to diminish. The first train PM_{10} level was 63.4µg/m^3 while the pre-train level was 6.8µg/m^3. The second train measured an average PM_{10} level of 39µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 4. Train 1	6.8µg/m^3	63.4µg/m^3	56.6µg/m^3
Signature 4. Train 2	6.8µg/m^3	39µg/m^3	32.2µg/m^3

Figure 5. Signature 5 – Loaded Coal Train Monday 5:12pm

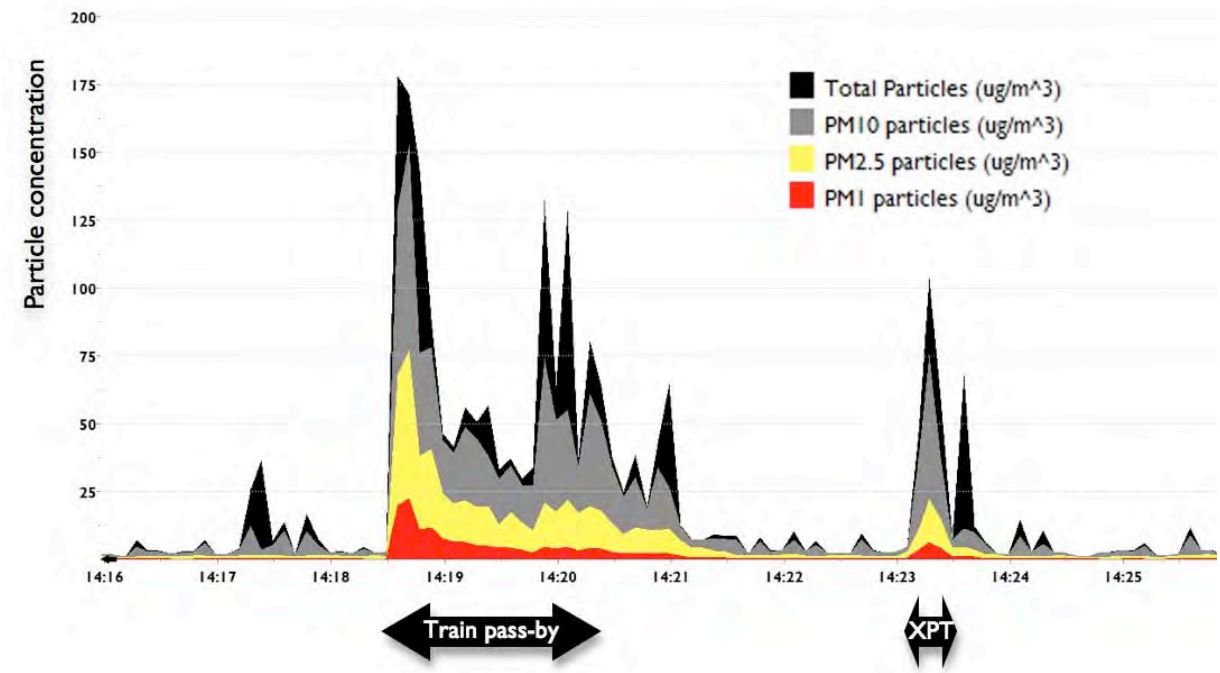


Signature 5 shows a loaded train (3 locomotives and 92 wagons) travelling at an average speed of 29km/hr. The wind speed was 0.7km/hr from the NNW, following the train. This signature was capture at the end of the first day of monitoring. Wind conditions were very still. The loaded coal signature is evident against increased background pollution levels from previous trains.

This signature shows a delay in plume arrival carrying a large proportion of PM_{10} with a long entrainment. A 30 second gap was added to adjust for plume delay, two minute average of train pass-by measured PM_{10} at 49µg/m^3 and two minute average for pre-train background levels at 9.3µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 5.	9.3µg/m^3	49µg/m^3	39.7µg/m^3

Figure 6. Signature 6 – Unloaded Coal Train Tuesday 2:18pm



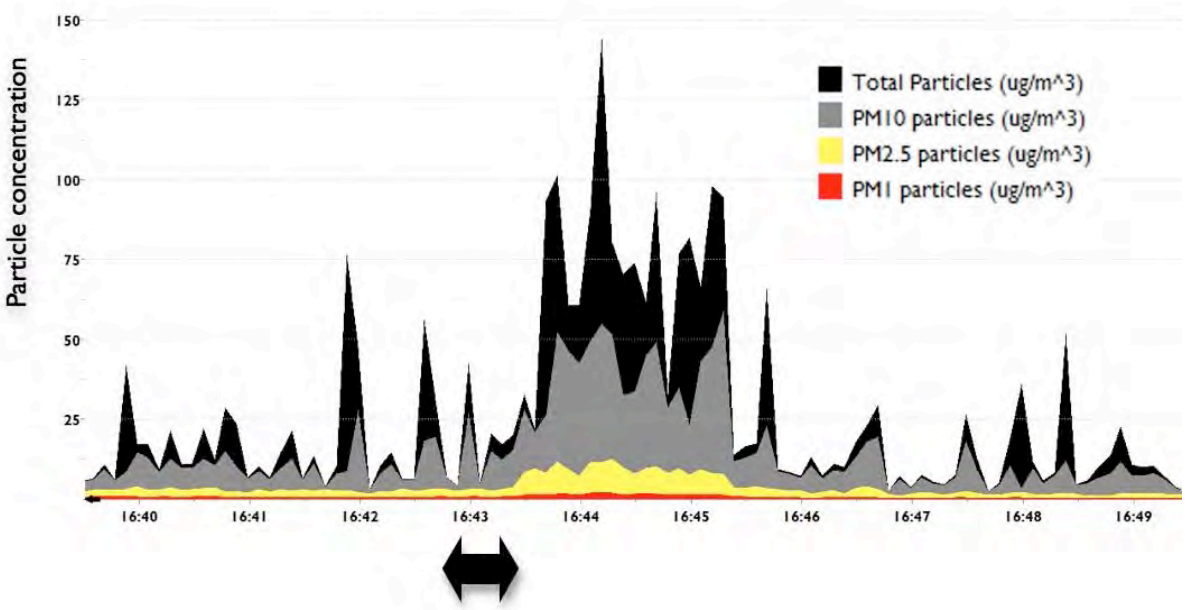
Signature 6 was termed the 'Midnight Oil' signature by an atmospheric scientist in honor of the band's 1987 hit album 'Diesel and Dust'. The unloaded coal train (3 locomotives and 82 wagons) approached the monitoring site travelling at 59km/hr and was heading into a NW 7.9km/hr wind. Logged observations noted that billowing smoke could be seen from the locomotives as the train approached and that the smell of diesel was distinguishable at the onset of the train pass-by.

The signature shows that the initial plume contained high concentration of PM_1 indicating diesel combustion. The wind speed was significantly stronger and this may account for the absence of a delay in the arrival of the initial pollution plume and also for the rapid dispersion of particulates back to baseline in less than three minutes. Average PM_{10} for the train pass-by was measured as 55µg/m^3 and pre-train average was 4.2µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 6.	4.2µg/m^3	55µg/m^3	50.8µg/m^3

In the wake of the 'Midnight Oil' train described above, a fast moving XPT CountryLink train was captured. This train produced a clear signature of very short duration, evident toward the right side of figure 6 above. This signature shows a diesel combustion spike and high proportion of PM_{10}, followed by a second short dust burst.

Figure 7. Signature 7 – Unloaded Coal Train Tuesday 16:42pm

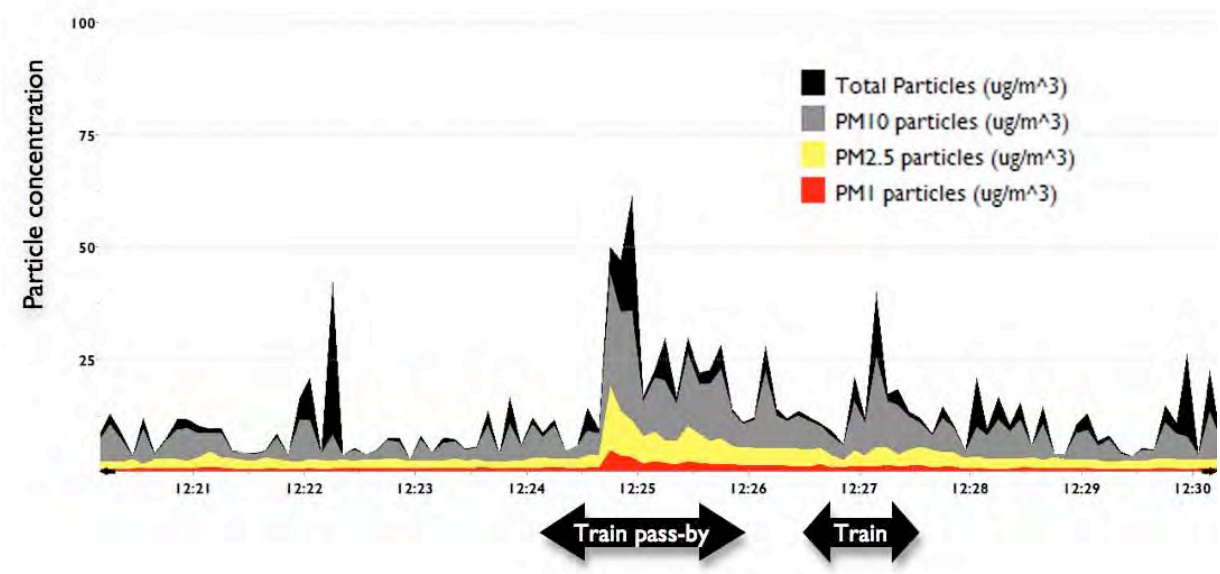


Signature 7 corresponds to a fast unloaded coal train (2 locomotives and 39 wagons) captured at Hexham on Tuesday. Initial train speed was calculated as 71km/hr with an average pass-by speed of 57km/hr. There was no wind during the pass-by.

The signature shows that the train had almost completely passed by before the pollution plume registered. The signature depicts high levels of PM_{10} and TSP and shows a relatively fast return to baseline levels. Two-minute averages of PM_{10} during train pass-by were measured as 39.3µg/m^3 and two minute pre-train background PM_{10} levels were 10µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 7.	10µg/m^3	39.3µg/m^3	29.3µg/m^3

Figure 8. Signature 8 – Loaded Coal and Freight Trains Wednesday 12:24pm



Signature 8 is a loaded coal train (3 locomotives and 96 wagons) captured at Beresfield on Wednesday. This train moved at a steady pace averaging 46km/hr. Wind speed was 4.4km/hr and followed the train from a NNW direction.

This signature is modest. TSP peaks at 63µg/m^3. High concentrations of PM_{10} are observed and there is a clear rise in PM_1 and $PM_{2.5}$. A 30 second gap was added to adjust for plume delay, two minute average of train pass-by measured PM_{10} at 19.4µg/m^3 and two minute average for pre-train background levels at 5.8µg/m^3.

Pollution Signature	Pre-train period (PM_{10})	Train period (PM_{10})	Difference (PM_{10})
Signature 8.	5.8µg/m^3	19.4µg/m^3	13.6µg/m^3

Summary of signatures

All coal train signatures were associated with a significant increase in PM_{10} particle pollution levels. In the case of Signatures 1 and 5, this represents increases of 94% and 427% respectively for loaded coal trains. Signature 6 increased PM_{10} concentrations significantly, up to 1210%. In sum, coal trains increase PM_{10} levels by between 94% and 1210%. While coal trains pass, particle pollution concentrations increase up to 13 times pre-coal train levels.

While the study was not intended to compare different types of trains, a number of freight and passenger trains were captured in our signature measurements. We noted city link trains did not produce a definable signature, while freight trains and the XPT did show signatures in some cases, but they were much smaller in comparison to those observed for coal trains, and of shorter duration.

The following chart and table provides a summary of PM_{10} particulate concentrations of the eight pollution signatures.

Chart 2: Particulate concentrations (PM_{10}) associated with train signatures

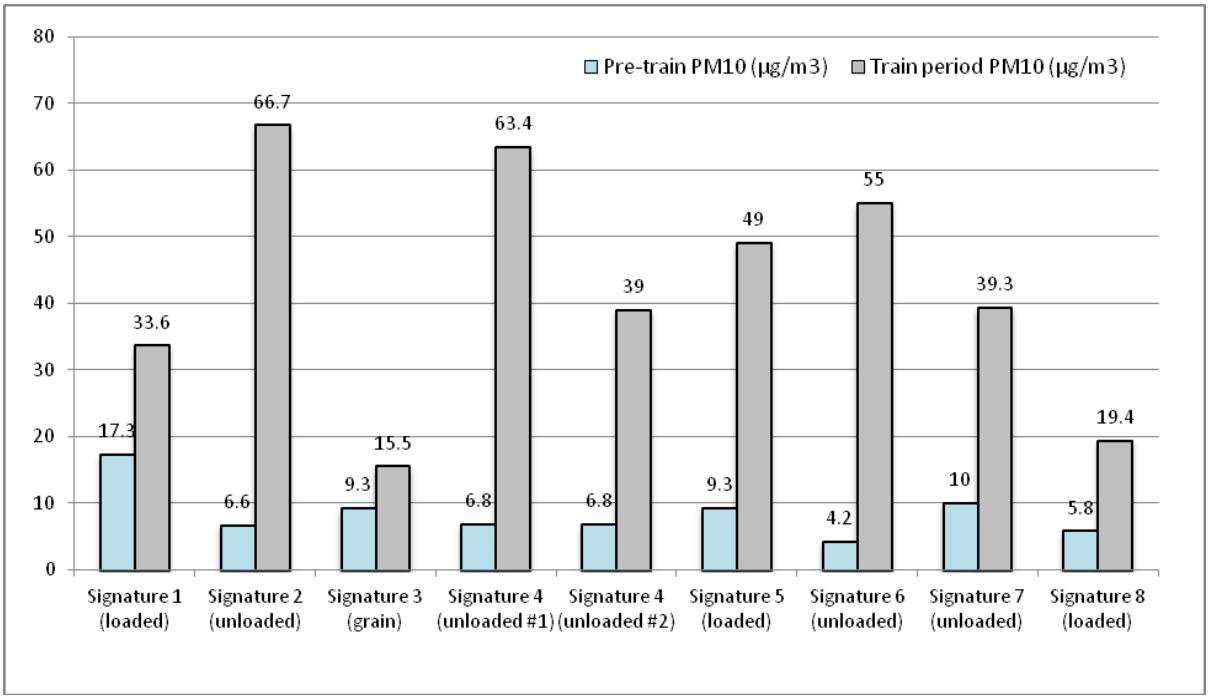


Table 6. Percentage differences of particulate concentrations (PM_{10}) associated with train signatures

Signatures	Pre-train PM_{10} (µg/m^3)	Train period PM_{10} (µg/m^3)	Difference	Difference (%)
1 – loaded	17.3	33.6	16.3	94%
2 – unloaded	6.6	66.7	60.1	911%
3 – grain	9.3	15.5	6.2	67%
4 – unloaded #1	6.8	63.4	56.6	832%
4 – unloaded #2	6.8	39	32.2	474%
5 – loaded	9.3	49	39.7	427%
6 – unloaded	4.2	55	50.8	1210%
7 – unloaded	10	39.3	29.3	293%
8 – loaded	5.8	19.4	13.6	234%

Note: The PM_{10} levels depicted above are two minutes averages of pre-train and train pass-by and are not peak levels recorded.

Statistical analysis

The full day's data for Monday and Tuesday was examined to compare the air quality in the time before each train arrived with the air during the train's passing. The data for Wednesday is still undergoing analyses and further results will be released at a later date. Data were analysed by calculating **pre-train periods** defined as the two minutes starting three minutes before the train arrived, and **train pass-by periods** defined as the two minutes starting 30 seconds after the locomotive passed. **Trains were excluded from analysis if another train was present during the prior period** (40% did not meet criterion). The analysis was repeated with criteria for maximum allowable average wind speed during the pre-train period, however this was not consequential as there was very light or no wind throughout the monitoring periods. All analysis was performed in Microsoft Excel except statistical testing which was performed in Stata 11.

Table 1: Full coal trains, pre-train period and train pass-by period PM_{10} in µg/m^3 for those 10 trains on 15th July where there was no other train present during the prior period.

Train time	Pre-train period (µg/m^3)	Train pass-by (µg/m^3)	Difference (µg/m^3)
12:27:11 PM	12.5	12.8	0.2
12:53:17 PM	12.9	14.9	2.0
1:40:47 PM	9.8	11.3	1.5
3:28:23 PM	6.6	34.8	28.3
3:37:05 PM	7.1	15.6	8.4
3:50:05 PM	11.5	26.1	14.6
4:03:17 PM	10.8	14.3	3.5
4:56:17 PM	12.5	21.3	8.8
5:12:17 PM	9.7	48.7	39.0
Averages	**10.38**	**22.2**	**11.81**

The average PM_{10} during the prior period was 10.38 and during the train period was 22.2 with a difference of 11.81 ($p= 0.031$, paired t test, 2 sided).

Table 2: Empty trains, pre-train period and train pass-by period PM_{10} for those 11 empty coal trains on 15th July where there was no other train present during the prior period.

Train time	Pre-train PM_{10} ($\mu g/m^3$)	Train pass-by PM_{10} ($\mu g/m^3$)	Difference ($\mu g/m^3$)
12:02:35 PM	15.2	16.9	1.7
12:12:11 PM	14.0	14.3	0.3
12:33:17 PM	10.7	17.8	7.1
1:04:17 PM	12.2	30.7	18.5
1:21:35 PM	13.3	45.9	32.6
1:54:53 PM	6.6	15.7	9.1
2:42:17 PM	6.6	66.7	60.1
2:58:17 PM	6.8	18.0	11.1
3:55:17 PM	10.7	48.2	37.5
4:21:17 PM	6.9	51.9	45.0
4:36:17 PM	6.7	30.1	23.4
Averages	**9.97**	**32.38**	**22.4**

The average PM_{10} during the prior period was 9.97$\mu g/m^3$, and during the train period was 32.38$\mu g/m^3$, with a difference of 22.41 (p=0.0032, paired t test, 2 sided).

Comparing the extra particulates associated with loaded and unloaded trains showed the mean increase was 11.78$\mu g/m^3$ (95% ci -3.51, 27.07) greater for unloaded trains although this result is not statistically significant.

Table 3: Loaded trains, prior period and train period PM_{10} and $PM_{2.5}$ for those 11 empty coal trains on 16th July where there was no other train present during the prior period.

Time	Pre-train PM_{10} $\mu g/m^3$	Train PM_{10} $\mu g/m^3$	Difference $\mu g/m^3$	Pre-train $PM_{2.5}$ $\mu g/m^3$	Train $PM_{2.5}$ $\mu g/m^3$	Difference $\mu g/m^3$
9:24:01 AM	22.6	24.5	1.9	7.6	9.3	1.7
10:09:01 AM	18.2	18.7	0.5	6.3	7.1	0.8
10:26:49 AM	16.0	22.4	6.4	5.4	7.6	2.2
11:18:47 AM	15.6	16.8	1.2	5.4	5.8	0.4
11:39:17 AM	18.9	20.7	1.7	5.2	5.6	0.5
11:55:47 AM	11.7	15.0	3.3	4.2	5.3	1.1
12:12:29 PM	8.8	14.1	5.3	3.1	5.4	2.3
1:00:11 PM	9.9	21.8	11.9	3.1	7.1	4.1
1:20:35 PM	6.4	8.6	2.1	2.6	3.4	0.8
3:16:41 PM	3.1	10.6	7.5	1.2	3.3	2.1
3:31:11 PM	5.2	32.2	27.0	1.8	13.3	11.5
3:56:23 PM	6.4	22.8	16.4	2.1	10.3	8.2
4:11:59 PM	11.3	20.3	9.0	3.7	6.3	2.6
Averages	**11.9**	**19.1**	**7.2**	**4.0**	**6.9**	**2.9**

The average PM_{10} during the pre-train period was 11.9µg/m^3, and during the train period was 19.1µg/m^3, with a difference of 7.2µg/m^3. The average $PM_{2.5}$ during the pre-train period was 4.0µg/m^3, and during the train period was 6.9µg/m^3, with a difference of 2.9µg/m^3.

Table 4: Unloaded trains, prior period and train period PM_{10} and $PM_{2.5}$ for those 11 empty coal trains on 16th July where there was no other train present during the prior period.

Time	**Pre-train PM_{10} (µg/m^3)**	**Train PM_{10} (µg/m^3)**	**Difference (µg/m^3)**	**Pre-train $PM_{2.5}$ (µg/m^3)**	**Train $PM_{2.5}$ (µg/m^3)**	**Difference (µg/m^3)**
10:40:43 AM	11.1	25.6	14.5	4.8	11.4	6.6
11:00:59 AM	18.0	26.0	8.1	6.0	9.9	3.9
12:59:59 PM	9.4	22.0	12.6	3.0	7.2	4.2
1:28:23 PM	8.0	15.0	7.0	2.8	7.3	4.5
2:04:17 PM	2.8	18.9	16.1	1.1	5.4	4.3
2:18:29 PM	4.2	39.2	35.0	1.3	15.9	14.6
2:29:11 PM	3.0	22.4	19.4	1.3	8.0	6.7
3:22:41 PM	4.0	7.0	3.0	1.3	2.9	1.6
3:51:59 PM	4.1	35.3	31.1	1.4	17.6	16.1
4:02:53 PM	5.1	37.4	32.3	1.6	10.7	9.0
4:42:47 PM	10.0	39.3	29.2	2.9	9.2	6.3
Average	**7.3**	**26.2**	**18.9**	**2.5**	**9.6**	**7.1**

The average PM_{10} during the pre-train period was 7.3µg/m^3, and during the train period was 26.2µg/m^3, with a difference of 18.9µg/m^3. The average $PM_{2.5}$ during the pre-train period was 2.5µg/m^3, and during the train period was 9.6µg/m^3, with a difference of 7.1µg/m^3.

6. Conclusions

This study found that 80% of coal trains produced a recognisable pollution signature. The signatures compromise a sharp rise in TSP, PM_{10}, $PM_{2.5}$ and PM_1 particulates, lasting 3.5 to 5 minutes. They show initial bursts of ultrafine PM_1 and fine $PM_{2.5}$ particulates indicating diesel combustion and chemical reaction processes. The ultrafine and fine particulates are contained within larger spikes of dust, mostly PM_{10}, the size associated with coal dust. Signature magnitude was seen to be influenced by factors such as wind speed and direction, train speed and distance from the monitor. The analysis of two minute segments of these signatures showed that PM_{10} levels were at least double pre-train particulate levels, and ranged up to 13 times larger.

Statistical analysis was performed on 60% of coal trains that met the inclusion criteria (i.e., no other train movement three minutes prior to arrival of the coal train). Analysis involved comparison of two minute pre-train background air quality with two minutes of train pass-by particulates. The results demonstrate a clearly measurable and statistically significant increase in particulate pollution during the time that coal trains passes through residential areas.

The results from the Osiris device used showed acceptable correlation to the reference TEOM but did not record identical particle concentrations. Applying a conversion equation to the Monday measurements would indicate an average increase of 18.8µg/m^3 for full trains and 33.9µg/m^3 for empty trains.

Incremental additions of air pollution of this magnitude into the airshed can add up to a large health problem, as everyone in the population is exposed. Health effects of air pollution are well documented, even below current standards. There is probably no lower threshold for adverse effects of pollution on human health. Even short-term exposures can be harmful, especially to vulnerable people with existing disease, children and the elderly.

Further analysis of the full dataset is ongoing and those results will be forthcoming.

7. Recommendations

1. That the NSW Government directs the state's coal industry to cover and wash all coal wagons (loaded and unloaded).

2. That the NSW Government suspend assessment of the proposed fourth coal terminal (T4). Particle pollution in Newcastle and elsewhere in the Hunter already regularly exceeds the national standard and measures are urgently required to improve urban air quality.

3. An independent assessment of the health impacts of particle pollution in the Hunter must be commissioned to assess the social and economic impacts of current particle concentrations and to model the impacts of the proposed T4.

References

[1] European World Health Organization, Air Quality review, 2013, p.7

[2] Estimation calculated by Associate Professor Nick Higginbotham

[3] NSW Dept of Health submission to the Dept of Planning regarding the Environmental Assessment for T4 dated 27th April, 2012.

[4] Colagiuri, R. Cochrane, J. Girgis, S. 2012, 'Health and Social Harms of Coal Mining in Local Communities: Spotlight on the Hunter Region', Beyond Zero Emissions, Melbourne.
Available: http://media.beyondzeroemissions.org/coal_health_Report_FINAL.pdf (accessed 4th March, 2013).

[5] Bramley, A. 9/8/13 'Doctors support Herald campaign', Newcastle Herald.
http://www.theherald.com.au/story/1695690/doctors-support-herald-campaign/?cs=303

[6] 'Australian doctors and councils call for more air quality monitoring', Radio Australia16/3/13
http://www.radioaustralia.net.au/international/radio/program/connect-asia/aust-doctors-and-councils-call-for-more-air-quality-monitoring/1117028?autoplay=1116902

[7] 'Hearing told reduction in air pollution a must' *Newcastle Herald* 16/4/13
http://www.theherald.com.au/story/1435519/hearing-told-reduction-in-air-pollution-a-must/

Comments on Longview DEIS- Chapter 5.7: Coal Dust
Submitted by Daniel Jaffe, June 2016
Professor of Atmospheric Chemistry
University of Washington Bothell
Comments based primarily on our two published studies

1. Diesel particulate matter emission factors and air quality implications from in-service rail in Washington State, USA, by D.A. Jaffe, G. Hof, S. Malashanka, J. Putz, J. Thayer, J.L. Fry, B. Ayres and J.R. Pierce, in *Atmospheric Pollution Research* 5, 344–351, doi: 10.5094/APR.2014.040.
2. Diesel particulate matter and coal dust from trains in the Columbia River Gorge, Washington State, USA, by D.A. Jaffe, J. Putz, G. Hof, G. Hof, J. Hee, D.A. Lommers-Johnson, F. Gabela, J.L. Fry, B. Ayres, M. Kelp and M. Minsk, in *Atmospheric Pollution Research,* doi: 10.1016/j.apr.2015.04.004.

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1. The DEIS seems to imply that coal dust does not contribute to inhalable particulate matter that contributes to human health problems (eg PM2.5). This is clearly not the case. To quote from the DEIS Coal Dust fact sheet "The study found that coal dust particles from rail cars are typically large and fall close to the rail tracks." Our data, and the Cowlitz County data, clearly indicate that coal dust constitutes a range of particle sizes including particles smaller than 2.5 micrometers in diameter. The EIS needs to clearly indicate that coal dust includes inhalable PM2.5.
2. Our peer-reviewed and published scientific analysis (Jaffe et al 2015) clearly indicates that the surfactant coating does not always work. At present there is no information on the cause of these failures. As such, it is impossible to know if additional coating facility (e.g. requiring a facility in Pasco) will significantly reduce coal dust emissions. The EIS needs to address what are the causes for failure in the surfactant coating.
3. The DEIS describes an "acceptable level of dust deposition" in terms of g/m2/month. However, nowhere does the document describe an **acceptable level of human health impacts.** Our data demonstrates short-term PM2.5 concentrations of up to 232 ug/m3 due to coal trains. These exposures were documented on private property adjacent to rail lines in the Columbia River Gorge (Jaffe et al 2015). This was due to a large, clearly visible cloud of coal dust. While the health effects of such <u>short-term</u> exposure have not been extensively studied, some peer-reviewed published scientific papers have documented significant health effects from short-term exposure to PM2.5 (Salvi et al 1999; Pope et al 2015; Li et al 2016). These short-term exposures are not currently regulated by the federal clean air act. Nonetheless, the DEIS should set an acceptable "nuisance" level for public health. In order words, what are the limits for coal dust and PM2.5 exposure on private property, and what are the consequences for exceeding these limits? I propose that the EIS define an acceptable level of short term coal dust/PM2.5 exposure of no more than 50 ug/m3 in a 3-minute average one time per year and that a

monitoring program be put in place to ensure this limit is achieved. Our data in the Columbia River Gorge show that approximately 97% of all coal trains would meet this standard. This limit should apply to all private property that is adjacent to rail lines that transport coal.

4. The coal dust modeling (e.g. table 5.7.2) fails to incorporate any failure rate into the calculations. Our data show that the failure rate for moving trains is at least 5%. The contribution from these coal trains where the surfactant has been misapplied (or not applied at all) likely dwarf the emissions from all other trains.
5. The DEIS reports on one study down in Cowlitz County (pg 5.7-5 main document and 2.2-4 in technical supplement). There are a number of problems associated with this study. First, this study was likely influenced by an inherent bias due to the fact that the shipper knew the date, time and location of the tests. They can then utilize their best operating conditions to minimize diesel, coal dust and other PM impacts. This is not the same as a "blind" test, whereby the shipper is not notified of the date and location of the testing. In particular, a "blind" test will identify the true failure rate for the surfactant and true coal dust emissions, whereas the biased test will not identify the true failure rate. This study apparently never saw a coal train with a PM2.5 concentration greater than 22 ug/m3 (Figure 4), whereas we identified coal trains with large dust plumes and much higher PM2.5 concentrations of up to 232 ug/m3. This is likely due to the fact that the shipper was aware of the testing that was taking place.
6. <u>Despite point 5 above,</u> the data from the Cowlitz study clearly show that the dust suppression methods are much less than 100% effective. This is because the observed <u>concentrations are 4 times higher than the modeled concentrations, as shown in Figure 4 of the SEPA Coal Technical Report.</u> Models are useful to estimate many environmental situations, but they must be constrained and confirmed by observations. In this case, the model is clearly not reproducing the observed concentrations. This can only be explained if the modeled coal dust emissions are <u>much larger</u> than what is being put into this model. The Cowlitz County data, shown in Figure 4, indicate that the model is under-estimating the coal dust emissions by about a factor of four. This would imply that the actual coal dust emissions are four times greater than the modeled emissions. The DEIS cites a dust suppression effectiveness of 61%, whereas the data <u>indicate an effectiveness of only 25%.</u> Section 2 in the technical document ends with Figure 4 and does not discuss the implications of this large discrepancy between the model and observations. It is absolutely essential that the modeling be redone with the significantly higher, and correct, coal dust emissions. <u>Based on both the UW and Cowlitz County</u> studies, the data show much higher dust emissions than are accounted for by the modeling.
7. Based on these results, the modeling should be redone using two different approaches: First, the model should assume that 5% of the coal trains had no surfactant (equivalent to saying that the surfactant was incorrectly applied or otherwise ineffective). The model results should then be re-evaluated based on this assumed failure rate. Second, the

modeling should be redone with a coal dust emission factor that is four times larger. This would be consistent with the Cowlitz County data presented in Figure 4 of the SEPA Coal Technical Report. This is particularly important given that the trigger level for impacts (2 g/m2/day) are already exceeded for some receptor location (Table 5.7-7) or very close to the currently model estimates (1.88 g/m2/day, Table 5.7-3) and that human health impacts from short term exposure to high concentrations have been documented.

References for health effect from short term PM2.5 exposure:

Salvi et al. Acute inflammatory responses in the airways and peripheral blood after short-term exposure to diesel exhaust in healthy human volunteers. Amer. J Resp.Crit Care Medicine. 159(3), 702-709, 1999.

Li et al. Short-term Exposure to Ambient Fine Particulate Matter Increases Hospitalizations and Mortality in COPD A Systematic Review and Meta-analysis. Chest 149 (2),447-458, DOI: 10.1378/chest.15-0513, 2016.

Pope et al. Short-Term Exposure to Fine Particulate Matter Air Pollution Is Preferentially Associated With the Risk of ST-Segment Elevation Acute Coronary Events. J Amer Heart Assn. 4 (12), e002506m, DOI: 10.1161/JAHA.115.002506, 2015.

HON. JOHN C. COUGHENOUR

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON

SIERRA CLUB, a California nonprofit corporation; PUGET SOUNDKEEPER ALLIANCE, a Washington nonprofit corporation; RE SOURCES FOR SUSTAINABLE COMMUNITIES, a Washington nonprofit corporation; COLUMBIA RIVERKEEPER, a Washington nonprofit corporation; FRIENDS OF THE COLUMBIA GORGE, INC., dba FRIENDS OF THE COLUMBIA GORGE, an Oregon nonprofit corporation; SPOKANE RIVERKEEPER; NATURAL RESOURCES DEFENSE COUNCIL, a New York nonprofit corporation,

Plaintiffs,

v.

BNSF RAILWAY COMPANY, a Delaware corporation,

Defendants.

CIVIL No. 2:13-cv-00967-JCC

DECLARATION OF MATTHEW RYAN IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION TO DISMISS

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I, Matthew Ryan, hereby declare:

1. I am over the age of 18, have personal knowledge of the following, and could competently testify if called as a witness in this legal action.
2. I reside at 9372 Cook-Underwood Road, Underwood, Washington, 98651, and have lived there for 21 years.
3. I am a member of Friends of the Columbia Gorge and of Columbia Riverkeeper because those organizations share my interest in protecting and restoring the natural and scenic values of the Columbia River and surrounding Columbia Gorge area. Friends of the Columbia Gorge (Friends) was initially founded to protect the Columbia River Gorge as a national scenic area, and now works to protect and preserve it. Friends accomplishes its mission through education and advocacy efforts, which include a focus on the quality of the Columbia River and its tributaries. Columbia Riverkeeper was founded to focus on the entire Columbia River, both upriver and downriver, and actively seeks to engage citizens in its conservation and environmental protection efforts. I support these groups because of their efforts to protect the Gorge waterways and scenic areas I love so much.
4. I understand that Friends of the Columbia Gorge, Columbia Riverkeeper, and other parties have filed a civil action asserting that Burlington Northern Santa Fe (BNSF) has discharged and is discharging coal and/or petroleum coke (petcoke) and their byproducts into Washington waterways without a permit.
5. I make this declaration in support of that action because it furthers my personal interests in the health and quality of the Columbia River, its tributaries, the Columbia River Gorge, and the communities and wildlife that depend on clean water in Washington state.

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6. I believe that coal and petcoke contamination from BNSF coal trains threatens the health of the Columbia Gorge and other waterbodies in which it is deposited. I know that coal contains some toxic chemicals, and it should not be allowed to fly out of the train cars into the Columbia River and other waterways. One of the reasons that I have lived in the Columbia River Gorge area for so many years is that it is a great place for outdoor recreation. But the continued discharges of coal and petcoke pollution significantly affects my ability, and that of my friends and family, to engage in recreational activities outdoors without fear of exposure to coal toxins. BNSF's coal pollution is negatively impacting my quality of life.

7. My concerns stem, in part, from my recreational interests in Columbia Gorge-area waterbodies, including the Columbia River, White Salmon River, Little White Salmon River/Drano Lake, Wind River, Spring Creek and the "Hatch," and the Klickitat River.

8. I enjoy canoeing, kayaking and paddleboarding, and engage in each of these activities four to five times per year (seasonally). I have a woodstrip canoe that I like to take out on the Columbia River, and I paddleboard there as well. I like to kayak on the Klickitat and White Salmon Rivers.

9. I also like to hike and ride my bicycle along roads and paths that follow Gorge waterways. I hike a couple of times per month. Falls Creek, a tributary of the Wind River, is one of my favorite hikes, and I hike there often. I ride my bicycle almost daily on roads that follow the White Salmon or the Klickitat, and I often see BNSF's coal train as I ride along Highway 14, which is right next to the Columbia River.

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10. My favorite recreational activities are kiteboarding and windsurfing, and the Columbia River Gorge is filled with great places to board and surf. This July, I was out windsurfing or kiteboarding twenty-eight out of thirty-one days, and over the course of a year, I probably windsurf and kiteboard between seventy-five and one hundred times. Some of my favorite spots are the "Hatch," next to its namesake Spring Creek Fish Hatchery, Swell City, Cheap Beach, and Doug's Beach. The mouth of the Klickitat River and mouth of the White Salmon River are also great places to windsurf and kiteboard.

11. I am growing increasingly concerned with the coal and petcoke contamination in Gorge waterbodies and my exposure to this pollution when I recreate in and around those waterbodies. I worry for my own health, the health of the fish and wildlife that depend on these waters, and the health of my fellow windsurfers, kiteboarders, and other Gorge recreationists. I am concerned about the general degradation of the waterways and the impact that pollution has on the quality of life of residents in the area.

12. I have frequently seen thousands of little BB-like pieces of coal within a couple hundred yard stretch in depressions between the gravel and the white fog line on the west side of the White Salmon near Highway 14. The coal bits appear to have been polished from tumbling around with the rocks. I have found coin-sized chunks of coal and small pellet-like pieces of coal on the railroad causeway on the south side of Drano Lake. I have also personally been pelted with coal chunks flying off of a passing coal train as I stood near my vehicle on Highway 14. Given the number of the BB- and pellet-size pieces that I have seen on the road, and the size and speed at which the coal chunks exit the train cars, I am very concerned that similar coal and petcoke chunks are being deposited directly

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into the Gorge waters as the coal trains pass over bridges and causeways through the Gorge.

13. My enjoyment of the recreational activities described above has been negatively impacted by my knowledge of the presence of coal and petcoke pollution, and if this pollution continues to degrade Gorge waters, my enjoyment will be further diminished. I hope that this lawsuit is successful in eliminating and cleaning up the coal pollution; otherwise, I may have to curtail or relocate the recreational activities that I enjoy so much and would like to continue.

14. If BNSF is required to cease contaminating Columbia Gorge waterways with the coal and petcoke pollution, then scenic, natural, and recreational values of the Columbia River Gorge area will be protected, in accordance with my personal interests and that of Friends of the Columbia Gorge and Columbia Riverkeeper. The Columbia Gorge ecosystem, including especially aquatic life, will become healthier, communities along the Gorge will be healthier, and outdoor enthusiasts like me will be able to fully enjoy our recreational pursuits.

15. In my personal opinion, coal and petcoke do not belong in the Gorge. They are not naturally occurring here. BNSF railroad and various coal companies are adding to their prior contamination of our waterways by transporting more coal, petcoke and related pollutants. The coal and petcoke pollution from the BNSF trains must not be allowed to continue.

16. If BNSF were required to cease its pollution of Columbia Gorge waters, my concerns about the negative effects of coal and petcoke pollution in Gorge waters would be

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lessened, and I would be able to enjoy the recreational activities described above without fear of exposure to toxic contaminants from BNSF trains.

I declare under penalty of perjury that all of the forgoing is true and correct.

Executed in Underwood, Washington this 30th day of August, 2013.

Matthew Ryan

8.30.13

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CERTIFICATE OF SERVICE

I hereby certify that on September 3, 2013, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system, which will automatically send notification of such filing to the following:

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HON. JOHN C. COUGHENOUR

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON

SIERRA CLUB, a California nonprofit corporation; PUGET SOUNDKEEPER ALLIANCE, a Washington nonprofit corporation; RE SOURCES FOR SUSTAINABLE COMMUNITIES, a Washington nonprofit corporation; COLUMBIA RIVERKEEPER, a Washington nonprofit corporation; FRIENDS OF THE COLUMBIA GORGE, INC., dba FRIENDS OF THE COLUMBIA GORGE, an Oregon nonprofit corporation; SPOKANE RIVERKEEPER; NATURAL RESOURCES DEFENSE COUNCIL, a New York nonprofit corporation, Plaintiffs, v. BNSF RAILWAY COMPANY, a Delaware corporation, Defendants.	CIVIL No. 2:13-cv-00967-JCC DECLARATION OF JEREMY BECHTEL IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION TO DISMISS

I, Jeremy Bechtel, hereby declare:

1. I am over the age of 18, have personal knowledge of the following, and could competently testify if called as a witness in this legal action.
2. I live at 2001 Salmon Falls Road, Washougal, Washington, 98671, and have lived there for about ten years.
3. I work as a sales representative for a beverage distributor based in Vancouver, Washington. My sales territory includes the Columbia River Gorge, so I travel daily on

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highways in the Gorge. I drive on Highway 14 between Lyle and Vancouver at least once per week.

4. I understand that Friends of the Columbia Gorge and other parties have filed a civil action asserting that Burlington Northern Santa Fe (BNSF) has discharged and is discharging coal and/or petroleum coke (petcoke) and their byproducts into Washington waterways without a permit.

5. I have been a member of Friends of the Columbia Gorge on and off since approximately 2008. Friends of the Columbia Gorge represents the scenic, natural, and recreational interest I have in the Columbia River Gorge area. Friends of the Columbia Gorge is the only non-profit organization I am aware of that is dedicated entirely to protecting the Columbia River Gorge.

6. I first became aware, and subsequently very concerned, about coal and petcoke contamination of Columbia River Gorge waters after an incident last August in which my vehicle, along with several others, was pelted with coal chunks up to the size of baseballs flying off of a BNSF coal train as I drove west on Highway 14 alongside the Columbia River. The incident is described in greater detail in a statement that I prepared shortly after the incident. A true and correct copy of the statement that I prepared is attached to this declaration as Exhibit 1. I prepared the statement to record my recollections of what occurred. The incident is most frightening experience that I have had during all of my years driving on Highway 14. I was surprised and relieved that a multi-vehicle accident did not occur. After this event, I began to research the issue of coal spilling from BNSF's trains and learned more about the potential consequences of the coal pollution.

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7. I began learning about other instances of coal and petcoke deposits coming from BNSF coal trains, and started noticing coal chunks along the side of the road on Highway 14. I have seen some coal bits approximately the size of peas and pencil erasers. Once I became aware of these deposits, I started to notice them more and more, and have observed that the sides of the tracks appear to be getting darker because of the coal deposit buildup. Seeing all of the coal deposits alongside the tracks, so close to Gorge waters, makes me very concerned that the coal is polluting the Columbia River and other waterbodies in the Gorge area.

8. My concerns stem, in part, from my recreational interests in Columbia Gorge-area waterbodies, including the Columbia River, White Salmon River, Little White Salmon River, Klickitat River, and Wind River.

9. I love rafting on the Columbia Gorge waters, and raft about 5-6 times per year. Currently, I am preparing for a trip to raft the length of the White Salmon River coming up the second weekend in September. I also enjoy fishing in these waters, specifically the Wind River, and fish approximately 2-3 times per year, although when the Steelhead population was healthier, I fished more often. It is important to me that the waters where I fish and raft are free of pollution. Knowing that BNSF's coal and petcoke discharges are polluting Gorge waters causes me to enjoy these activities less. I intend to continue rafting and fishing, but would like to do so without concern of exposure to toxic coal pollutants.

10. I also really enjoy birdwatching, and especially like to watch the eagles at the Klickitat River on a sandspit. I am concerned about the fact that these birds are feeding in the water right underneath the train trestle, and worry about the effects that the coal

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contamination might have on them and on the osprey and other birds that nest or feed in that area. I want to continue to observe the birds and other species in the Columbia Gorge region, but would like to do so without worrying that they are exposed to or ingesting coal pollution.

11. I like to forage and berry-pick, and have found some great places in the Gorge area to forage for mushrooms. There is a creek just east of Stevenson, near the train tracks, that tends to be a good place to find chanterelles in the fall. I also like to forage for them along the Wind River. I enjoy picking berries, and just picked some huckleberries a few weeks ago. I forage about 15-20 times during a season, and berry-pick about 3 or 4 times per season. Since the mushrooms and berries that I gather will ultimately be eaten by me or my family and friends, it is important to me that they are sourced from clean, pollution-free areas. My knowledge of the presence of coal pollution in areas where I gather food gives me great concern. I would like to be able to engage in these activities without fear that I am exposing myself to coal contamination.

12. My enjoyment of the recreational activities I listed above is already diminished by my knowledge of the presence of coal, petcoke and related pollution in the Gorge waterways, and if this pollution continues to degrade Gorge waters, my enjoyment will be further diminished.

13. I am very interested in pursuing kiteboarding and stand-up paddling as recreational activities. These activities are popular recreational pastimes in the Columbia Gorge and appear to be very enjoyable. However, I am reluctant to engage in these activities because of my knowledge that the Columbia River and its tributaries are being polluted with coal and petcoke from BNSF coal trains. Since kiteboarding and stand-up paddling

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brings people into direct contact with the water, I am worried about the possible increased exposure to coal toxins. If I knew that BNSF was no longer discharging coal and petcoke into Gorge waters, I would engage in one or both of these activities.

14. If, as a result of this lawsuit, BNSF is required to cease contaminating Columbia Gorge waterways with the coal and petcoke pollution, then my recreational and scenic interests and the interests of Friends of the Columbia Gorge will be protected.

15. In addition to the concerns that I have over the current coal pollution to waters of the Columbia River Gorge as the trains pass through the region, I am also worried about the possibility of a train derailment. I have noticed the buildup of coal particles on the tracks and in the ballasts, and am concerned that if this buildup continues, it could eventually lead to a train derailment. A derailment in this area would be disastrous—it could cause serious injuries to people on or near the train, block access to emergency or other essential services and utilities, and dump massive quantities of coal and petcoke into nearby waters. With the possibility of increased coal train traffic, the buildup on the tracks will likely increase as well, making the threat of a derailment very real.

16. In my opinion, coal and petcoke do not belong in the waters of the Gorge. They are not naturally occurring here. I am very concerned about the effect that these pollutants have on the Columbia River, its tributaries, the species that depend on clean water, and the health and recreational interests of me and my family and friends. If BNSF were required to stop discharging coal pollutants into Columbia River Gorge waters, my concerns in these areas would lessen and I would be able to once again engage in the recreational activities described above with greater peace of mind and heightened enjoyment.

///

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I declare under penalty of perjury that all of the forgoing is true and correct.

Executed in Washougal, Wash. this 29th day of August, 2013.

Jeremy Bechtel

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CERTIFICATE OF SERVICE

I hereby certify that on September 3, 2013, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system, which will automatically send notification of such filing to the following:

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Sarah Matsumoto, *an employee of*
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Declaration of Jeremy Bechtel
Exhibit 1

August 22, 2012

Compiled by: Friends of the Columbia Gorge (FoCG)

As told by: Jeremy Bechtel, husband of a FoCG staff member (Full Disclosure)

[A COAL TRAIN INCIDENT ON WA HIGHWAY 14]

While driving in a line of traffic on WA Highway 14 in the Columbia Gorge, Jeremy Bechtel was pelted with chunks of coal and coal dust from a coal train traveling close to the highway. This almost resulted in a multi-car accident. Click on the aerial photo below to open a Google Map showing where this incident took place.

STATE OF WASHINGTON

COUNTY OF SKAMANIA

DECLARATION OF JEREMY BECHTEL

I, JEREMY BECHTEL, make this declaration based upon my personal knowledge and belief and declare as follows:

1. I am a resident of Skamania County, Washington.

2. I am currently a member and supporter of Friends of the Columbia Gorge. I support Friends of the Columbia Gorge because it advocates for my interest in protecting the scenic, natural, cultural, and recreational resources of the Columbia River Gorge and surrounding landscapes.

3. I live at 2001 Salmon Falls Road, Washougal, WA 98671 which is located approximately 20 miles west of where the coal train incident I describe below took place. I have lived at this address for 9.5 years.

4. I work as a sales representative for Stein Distributing, a distributor of beer, wine and natural beverages located in Vancouver, Washington. My job involves daily travel on highways in the Columbia Gorge.

5. In addition to driving through the Columbia Gorge for work, my family and I drive through the Columbia Gorge for daily household trips, such as shopping for groceries. We also recreate in the Gorge and use Highway 14 to access numerous recreation sites.

6. A large increase in the number of coal trains traveling along the Burlington Northern Santa Fe (BNSF) railroad, which closely parallels Washington State Highway 14 in the Columbia Gorge, would increase the likelihood of dangerous incidents resulting from coal dust

blow-offs, such as an incident I recently experienced that nearly resulted in a multi-vehicle accident, as described below.

7. I am regularly exposed to coal dust from trains on the BNSF railroad when I travel Highway 14 in the Columbia Gorge.

8. On August 22, 2012 at approximately 4:00 p.m., I was driving back from a sales call, headed west on Highway 14 near milepost 51 in a line of traffic. In front of me was a semi-truck followed by one car. Behind me was another car that was tailgating (following too close to) my vehicle. On the train tracks paralleling the highway, approximately 15 feet from our vehicles, a coal train was keeping pace with us as we traveled westward. The train suddenly rounded a sharp bend in the tracks, which exposed the railcars to a strong westerly wind (I estimate it at 30 mph). Coal from at least four of the railcars blew in a northeast direction off the top of the cars and bombarded the line of vehicles I was in. Coal chunks as big as baseballs collided with my vehicle's windshield, and it was only because the coal was soft and broke up upon impact that the coal did not puncture or break my windshield.. The coal chunks left tar marks on my vehicle.

9. The semi-truck, being the first vehicle in the line-up, was hit by the most coal dust and coal chunks. The semi-truck driver suddenly slammed on his brakes causing a chain reaction. The car ahead of me had to slam on its brakes to avoid an accident. In turn, I also had to brake, but I was concerned about being hit by the car tailgating me, so I steered to the right into the road gravel in order to create space for the car behind me to slow down. . I was very concerned about getting rear-ended by the car behind me, but fortunately the semi-truck passed through the worst of the coal bombardment and started accelerating again, which allowed all of us to put more space between our vehicles.

10. I was shaken by this incident and consider it the closest near-accident I have had in all my years of driving in the Columbia Gorge, including winter-time driving. For the sake of my family and my business driving, I do not want to see an increase of coal trains traveling through the Columbia Gorge.

11. The cover page of this declaration shows photographs of the location of the August 22, 2012 coal train incident and an aerial photo from Google Maps identifying where this took place.

12. I declare under penalty of perjury that the foregoing is true and correct to the best of my personal knowledge, information, and belief.

Executed in Washougal, Washington this 31st day of October, 2012.

Jeremy Bechtel

HON. JOHN C. COUGHENOUR

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON

SIERRA CLUB, a California nonprofit corporation; PUGET SOUNDKEEPER ALLIANCE, a Washington nonprofit corporation; RE SOURCES FOR SUSTAINABLE COMMUNITIES, a Washington nonprofit corporation; COLUMBIA RIVERKEEPER, a Washington nonprofit corporation; FRIENDS OF THE COLUMBIA GORGE, INC., dba FRIENDS OF THE COLUMBIA GORGE, an Oregon nonprofit corporation; SPOKANE RIVERKEEPER; NATURAL RESOURCES DEFENSE COUNCIL, a New York nonprofit corporation, Plaintiffs, v. BNSF RAILWAY COMPANY, a Delaware corporation, Defendants.	CIVIL No. 2:13-cv-00967-JCC DECLARATION OF DAVID BERGER IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION TO DISMISS

I, David Berger, hereby declare:

1. I am over the age of 18, have personal knowledge of the following, and could competently testify if called as a witness in this legal action. I am aware that Columbia

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Riverkeeper and other parties have filed a civil action asserting that Burlington Northern Santa Fe (BNSF) has discharged and is discharging coal, coal dust and/or petroleum coke (petcoke) and their byproducts into Washington waters without a permit in violation of the Clean Water Act. Columbia Riverkeeper represents my interests in this lawsuit.

2. I make this declaration in support of this litigation because I believe it is necessary to protect the water quality of the Columbia River watershed, where I live and recreate. I also believe this litigation is necessary to protect the safety of my small community from the danger associated with coal and coal dust being deposited into the water and on the railroad tracks.

3. I reside at 728 7th Street, Lyle, Washington 98635. Lyle is a small town located in Klickitat County, along the shore of the Columbia River in Washington state. I have lived in Lyle for approximately eight years.

4. Prior to residing in Lyle, I received my Bachelor's of Science degree in mechanical engineering. I also obtained a Master's Degree in environmental engineering in water, wastewater treatment and water quality modeling from Manhattan College in New York City in 1974. After receiving my Master's, I worked for the Environmental Protection Agency in both New York City and Portland, Oregon. At EPA, my work duties included administering grants for sewage treatment facilities, and inspecting industries for compliance with air quality and hazardous waste regulations. Between the two EPA jobs, I worked for Hydroscience Inc., a private consulting company, as a water quality computer modeling engineer. I have also worked for Oregon Department of Environmental Quality where my work duties included reviewing permits and inspecting industries for compliance with water and air quality regulations. I also served as a

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contractor for the City of Portland on special industrial waste treatment projects, and an air quality study. In 1980, I created a part of a civil/mechanical engineering program at Portland Community College teaching classes to engineering students on water, air, hazardous waste and ground water pollution control. I taught these classes and other engineering math, and chemistry classes for approximately 24 years and then moved to Lyle, Washington, where I now consider myself to be retired.

5. I am an active member and supporter of Columbia Riverkeeper, and I have been an active volunteer with Columbia Riverkeeper for the last eight years. Columbia Riverkeeper is a non-profit organization that works to protect the Columbia River watershed. I enjoy working with and contributing to Columbia Riverkeeper because they do a lot of the water quality monitoring work that government agencies like Oregon Department of Environmental Quality used to do. As an environmental engineer, I believe that water quality monitoring is an important part of protecting and restoring the Columbia River.

6. I submit an annual donation to support the work of Columbia Riverkeeper and have volunteered as a water quality sampler for the previous seven years. I have not been able to do any water quality monitoring this year. As volunteers, we took water samples at Doug's Beach on the Columbia River and an unnamed public park on the Klickitat River, about one mile above the confluence with the Columbia River. We sampled and recorded data for dissolved oxygen, pH, turbidity, temperature, and conductivity. Columbia Riverkeeper routinely monitors the quality of the waterways in the Columbia River watershed as part of its advocacy and education work.

7. I have also been engaged in other activities on behalf of Columbia Riverkeeper. As a volunteer, I have collected names and contact information of individuals interested in

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supporting the organization, and have attended public meetings as a member of Columbia Riverkeeper, and on my own behalf on environmental issues related to the water quality of the Columbia River, including but not limited to wetland protection, a coal burning power plant, coal transport, Hanford Nuclear Reservation, and land use. On my own behalf, I have written letters to the editors of newspapers about coal and its impact on the environment.

8. In addition to being a member of Columbia Riverkeeper, I am also a member of Friends of Columbia Gorge, a former Board member for the Klickitat Trail Conservancy and a former Board member of the Oregon Conservancy Foundation.

9. I believe that the burning and transportation of coal is one of the most significant problems that the Columbia River faces today. I am concerned about the presence of coal, coal dust and petcoke in the Columbia River and the waters that feed the Columbia River because I believe the presence of coal in the water pollutes the water and creates a threat to public safety because of the heavy metals contained in the coal. In addition, the ultimate burning of the coal emits mercury into the atmosphere, which studies have shown can end up in the Columbia River Basin, regardless of where the coal is ultimately burned.

10. I believe that the transportation of coal in the uncovered coal cars used by BNSF constitutes a threat to the public safety of the community of Lyle. Lyle is a small town, with only a volunteer fire department. It is my understanding that the deposition of coal and coal dust on the tracks that spill out of the rail cars can lead to more frequent train derailments, accidents, and fires. The small community of Lyle would be ill equipped to

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deal with the aftermath of any kind of coal-related derailment, whether on the land or in the waterways.

11. I live and own my own home approximately one mile away from the Columbia River. I see the Columbia River everyday, regularly observe and photograph the wildlife that reside and depend upon the Columbia River, regularly swim in the River during the summer months, and whitewater and flat water kayak in the Columbia River and its tributaries.

12. I am aware that there are plans to build more coal transport terminals in Washington, which increases the likelihood that additional coal-carrying trains will travel over and adjacent to the Columbia River, depositing more coal and coal dust into the watershed. For me, this will diminish the aesthetic value of living in Lyle. I also think this could indirectly affect the economic value of my own property. Lyle is such a small community that, even though the train does not pass adjacent to my property and thus does not spill chunks of coal onto my property to my knowledge, the economic impact on other properties that are alongside the rails would necessarily affect the value of my own property.

13. My recreational interests and activities revolve around a number of rivers and lakes in the Columbia River watershed that I have visited frequently, and that I intend to visit again on at least an annual basis. In terms of the transportation of coal on railways by BNSF, I am particularly concerned about the Columbia River, Klickitat River, White Salmon River, Rowland Lake, Spearfish Lake, Horsethief Lake, and Major Creek. Many of the foregoing waterways that I visit and use are impacted by coal and coal dust pollution

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from the BNSF coal trains because the coal trains pass adjacent and/or directly over them.

14. I regularly engage in open-water swimming, whitewater and flat water kayaking, hiking, bird watching, nature study, photography, cycling, and picnicking on or along the banks of the water bodies listed above. The presence of coal in the water detracts from my enjoyment of all of these activities in that it will impact the food chain, have deleterious affects on wildlife, harm visibility, and damage water quality.

15. As an open-water swimmer, I believe that the presence of coal in the water constitutes a threat to my health. The toxins that I am aware of in coal include heavy metals, which are known to be harmful in even small doses. Fortunately, when I am swimming, I only take in a small amount of water, but the levels of heavy metals in the water will only increase with more coal spilled into the waters in which I swim.

16. I am also concerned for others who engage in other forms of recreation, such as windsurfing, that requires the participants to take in much more water. While I do not personally eat fish caught from the Columbia River, I am concerned for the Tribal fishermen whose way of life depends upon fish caught and eaten from the waters of the Columbia River watershed. The Tribal fishermen serve a vital role in the local economy and coal in the water necessarily detracts from this historically and culturally significant part of the Columbia River economy.

17. Because I live so close to and recreate on the Columbia River, I also enjoy looking at the water. The Columbia River is a sight to behold. The presence of coal and coal dust in the water degrades this recreational experience and contributes to the water quality problems of the Columbia River.

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18. I have personally seen coal collected by staff or volunteers for Friends of the Gorge along the north side of the Columbia River, adjacent to the BNSF train tracks at Columbia Hills State Park. I believe that there is coal in the waters of the Columbia River that is not visible from the surface since the trains pass directly over and adjacent to the River in many places on the route from Eastern Washington to Portland, Oregon. In fact, the train passes directly over the water at one of my favorite swimming spots, Horsethief Lake. Horsethief Lake is adjacent to the Columbia River and is only separated from the River by the berm for the railroad tracks. Therefore, coal spilling into the river at this point directly affects my ability to swim at Horsethief Lake.

19. I believe that BNSF's deposition of coal, coal dust and petcoke into the Columbia River watershed has harmed me because coal in the water negatively affects my ability to engage in recreational activities that I enjoy and threatens the community in which I live. I believe that if the court were to issue a decision requiring BNSF to operate in a manner that ensures that no coal or coal dust is deposited into the Columbia River watershed, my interests in preserving my way of life and protecting the environment in my community would be protected.

I declare under penalty of perjury that all of the forgoing is true and correct.

Executed in Lyle, Washington, on August 30, 2013.

David Berger

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CERTIFICATE OF SERVICE

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s/ Sarah Matsumoto
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HON. JOHN C. COUGHENOUR

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON

SIERRA CLUB, a California nonprofit corporation; PUGET SOUNDKEEPER ALLIANCE, a Washington nonprofit corporation; RE SOURCES FOR SUSTAINABLE COMMUNITIES, a Washington nonprofit corporation; COLUMBIA RIVERKEEPER, a Washington nonprofit corporation; FRIENDS OF THE COLUMBIA GORGE, INC., dba FRIENDS OF THE COLUMBIA GORGE, an Oregon nonprofit corporation; SPOKANE RIVERKEEPER; NATURAL RESOURCES DEFENSE COUNCIL, a New York nonprofit corporation,

Plaintiffs,

v.

BNSF RAILWAY COMPANY, a Delaware corporation.

Defendants.

CIVIL No. 2:13-cv-00967-JCC

DECLARATION OF PETER CORNELISON IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION TO DISMISS

I, Peter Cornelison, hereby declare:

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1. I am over the age of 18, have personal knowledge of the following, and could competently testify if called as a witness in this legal action.
2. My principal place of business is the office of Friends of the Columbia Gorge located at 205 Oak Street, #17, Hood River, OR 97031. I serve as Field Representative for the organization.
3. I understand that Friends of the Columbia Gorge and other parties have filed a civil action asserting that Burlington Northern Santa Fe (BNSF) has discharged and is discharging coal and/or petroleum coke (petcoke) and their byproducts into Washington waterways without a permit.
4. In light of my personal and professional concern about the health of the Columbia Gorge, I am please to offer my declaration.
5. Friends of Columbia Gorge was founded in 1980 to seek federal protection for the Columbia River Gorge as a national scenic area. Friends of the Columbia Gorge is the only non-profit organization dedicated entirely to protecting the Columbia River Gorge. I am a member of Friends of the Columbia Gorge, and have been since 2003. As well, I have served as the organization's field representative since 2003, in which capacity I am responsible for building support and activism among Gorge residents for protecting the Columbia Gorge.
6. I am also a Hood River resident and have been active in a number of local conservation causes.
7. Contamination of Washington waterways with coal and petcoke from BNSF threatens the health of the Columbia Gorge.

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8. I live and own property just a mile away from the Columbia River, travel by it everyday, and work in Friends' offices in the city of Hood River just five blocks from the confluence of the Hood and Columbia Rivers.

9. My concerns stem, in part, from my recreational interests in Columbia Gorge-area waterbodies, including the Columbia River, White Salmon River, Little White Salmon River, Wind River, Rock Creek and the Klickitat River. The BNSF rail road train tracks are very close proximity, either next to these rivers or the tracks cross over these rivers. In these rivers, on at least an annual basis, I engage in kayaking (about 5-7 times per year), windsurfing (about 3-4 times per year), rafting (2-3 times per year), swimming (5-6 times per year), fishing (3-4 times per year) and, at least weekly outside of winter months, engage in hiking, stream-walking, and photography. I know all of these rivers from at least one of these activities. For example, this month (August 2013) I rafted down the White Salmon River. I hope to continue these activities in these waterways, and expect within the next year also to take up kite-boarding and standup paddle boarding in the Columbia Gorge.

10. However, I am increasingly concerned about contact with water that is contaminated by coal and petcoke, and with the increasing degree to which the quality of the waterways is degraded by the coal and petcoke discharges from the trains. If the contamination of Columbia Gorge waterways by the coal and petcoke trains is not stopped by this civil action, then a central feature of our organization's mission and my personal and professional goal to protect the Gorge will be undermined. As well, I will face a continuing risk of damaged health if I continue to pursue water-contact activities in the face of mounting pollution from BSNF's offending trains. Accordingly, I anticipate that

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I will need to curtail or cease engaging in them, unless through this litigation the coal train contamination is halted and the coal in the rivers cleaned up. Right now, I try to avoid areas where I know that excessive coal is present.

11. My enjoyment of the recreational activities I listed above is already diminished by my knowledge of the presence of coal, petcoke and related pollution in the Gorge waterways, and if this pollution continues to degrade Gorge waters, my enjoyment will be further diminished.

12. On the other hand, if by this lawsuit BNSF is required to cease contaminating Columbia Gorge waterways with the coal and petcoke pollution, then the Gorge ecosystem, including especially aquatic life, will become healthier, communities along the Gorge will be healthier, the mission of Friends of the Columbia Gorge will be supported, and I and others concerned about the present pollution will be able to breathe easier while pursuing our profession and personal interests.

13. In key respects, my recreational interests intersect with and bolster my professional work. Some of the activities in which I regularly engage in the Gorge area aim to increase member and public commitment to protection of the Columbia Gorge. Accordingly, I help lead a number of hikes and picnics each year to introduce, share and reconnect members and supporters of Friends with the beauty and grandeur of the Columbia Gorge area. However, the increased contamination from BNSF's coal and petcoke trains is diminishing my enjoyment of and the beauty of these hikes and picnics. I would like to be able to lead members and supporters of Friends in these activities without fear of exposure to coal, petcoke and related pollution.

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14. In my professional opinion, coal and petcoke do not belong in the Gorge. They are not naturally occurring here. Accordingly, BNSF Railway Company is introducing a foreign substance by its injection of coal and petcoke into Gorge waterways. Coal, petcoke and related materials are pollutants, and such contaminated water may impose both physical and chemical harm to juvenile salmon, other fish, and other aquatic life. My concern in this regard was amplified by a recent article from Sightline Research Institute titled "How Coal Affects Water Quality: State of the Science." BNSF railroad and various coal companies are compounding their prior contamination of our waterways with more coal, petcoke and related pollutants.

15. I have personally observed how the coal, petcoke and related pollutants caused by the trains deposit large quantities of chunks and dust onto steep slopes immediately adjacent to and over these waterways. I have seen this at the confluences of the Columbia River and the White Salmon River, Little White Salmon River, Wind River and Rock Creek and an unnamed creek in Murdock, WA. I have also seen this by boat along a section of elevated railroad track at Horsethief Lake, WA.

16. Coal and petcoke are already polluting the Columbia Gorge and have accumulated to a depth of two to six inches at a number of places on land and at numerous places where the tracks are near water (although the dust is dispersed in water). This is from just one to four coal and petcoke trains per day. Present coal terminal proposals, if built, could lead to the increase of this train traffic up to 20 to 30 coal and petcoke trains per day.

17. The coal and petcoke pollution from the BNSF trains must not be allowed to continue and further pollute the unique geologic, cultural and scenic treasure that is the Columbia Gorge National Scenic Area.

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I declare under penalty of perjury that all of the forgoing is true and correct.

Executed in Hood River, Oregon this 2nd day of September, 2013.

Peter Cornelison

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CERTIFICATE OF SERVICE

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s/ Sarah Matsumoto
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HON. JOHN C. COUGHENOUR

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON

SIERRA CLUB, a California nonprofit corporation; PUGET SOUNDKEEPER ALLIANCE, a Washington nonprofit corporation; RE SOURCES FOR SUSTAINABLE COMMUNITIES, a Washington nonprofit corporation; COLUMBIA RIVERKEEPER, a Washington nonprofit corporation; FRIENDS OF THE COLUMBIA GORGE, INC., dba FRIENDS OF THE COLUMBIA GORGE, an Oregon nonprofit corporation; SPOKANE RIVERKEEPER; NATURAL RESOURCES DEFENSE COUNCIL, a New York nonprofit corporation, Plaintiffs, v. BNSF RAILWAY COMPANY, Defendant.	CIVIL No. 2:13-cv-00967-JCC DECLARATION OF MICHAEL LANG IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION TO DISMISS

I, Michael J. Lang hereby declare:

1. I am over the age of 18, have personal knowledge of the following, and could competently testify if called as a witness in this legal action.

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2. My principal place of business is the office of Friends of the Columbia Gorge located at 522 S.W. 5th Ave, #720, Portland, OR 97204. I serve as Conservation Director for the organization.

3. Friends of the Columbia Gorge and other parties have filed an action under the Clean Water Act against Burlington Northern Santa Fe (BNSF) for its unpermitted discharges of coal and petroleum coke (petcoke) and their byproducts into Washington waterways, including the Columbia River.

4. I make this declaration in support of that action.

5. Friends of Columbia Gorge was founded to protect the Columbia River Gorge as a national scenic area and now works to protect its natural and scenic values. We work to achieve our mission by educating the public about the outstanding resources of the Gorge and advocating for protection of those resources – including the quality of the Columbia River and its tributaries – by the enforcement of critical environmental laws.

6. I am a member of Friends of the Columbia Gorge.

7. I have served as the organization's Conservation Director since 1997, in which capacity I oversee all aspects of our monitoring and litigation program, policy development and advocacy, coalition building, public education and media work, and lobbying efforts.

8. I am personally and professionally concerned about coal contamination of Washington waterways stemming from BNSF coal trains.

9. The Columbia River Gorge was designated by Congress as a national scenic area in recognition of its natural beauty and environmental integrity. The large quantities of coal and petcoke discharged from BNSF trains undermine those values. Friends of the Columbia Gorge's primary mission is to protect the Gorge. Accordingly, it is imperative

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to my organization that BNSF be made to cease its discharges of coal and petcoke into Washington waterways.

10. My concern also stems from my personal activities in Columbia Gorge-area waterbodies. I am an avid recreational fisherman, and fish for steelhead and trout on the tributaries of the Columbia -- including in the Sandy River, Deschutes River and the Klickitat River. The BNSF coal and petcoke discharges threaten both the health of the species that I fish for and the health of people who consume these fish.

11. I also regularly hike – at least once per year – along many Washington tributaries that feed into the Columbia River, including Catherine Creek, Gibbons Creek, Duncan Creek, Woodard Creek, Hardy Creek, Hamilton Creek, Greenleaf Creek, the Little White Salmon River, the White Salmon River, the Wind River, and the Klickitat River. BNSF's trains cross these tributaries. As well, I hike along the Columbia River. When hiking, I engage in bird-watching, wildlife observation, plant identification and photography. Often these hikes include my family, and the outings often include picnics.

12. Through my work and in recreation I have occasion to travel along the Columbia River, often on its north side. I have frequently seen coal contamination from the BNSF. In particular, I have witnessed coal contamination at the mouth of the Little White Salmon River and on the banks of the Columbia River. I have also witnessed the coal contamination at Columbia Hills State Park along the banks of the Columbia River and within the river. The presence of coal and petcoke contamination of these banks means that coal and petcoke were and are directly discharged by BNSF into the Columbia River.

13. My concerns about this contamination are several. First, I am concerned about impacts to human health, since I and people in communities throughout the Columbia Gorge

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consume Columbia River fish and, because the contamination is cumulative, the fish increasingly are contaminated with coal and petcoke and their by-products discharged by the BNSF trains. Accordingly, I am concerned that these toxins will find their way into the bodies of persons living in communities up and down the Columbia, and in fact wherever the fish are consumed - including by my family and me.

14. Second, I am concerned about the health of the fish populations and other organisms that are confronted with degraded habitat, as their habitats are critical to their lifecycles. I am also concerned about other waterfowl and mammals that use the Columbia River and its tributaries, and so feed on the salmon, other fish, and other river organisms. These include Columbia River sturgeon, otter, beaver, bald eagle, osprey, cormorants and other birds of prey.

15. Third, I am concerned about the impact of the water quality degradation on the future of the Columbia Gorge region itself. In particular, I fear that the increasingly degraded water quality, and the widespread knowledge of that adverse development, will diminish the quality of life and quality of the experience for those living or visiting the Gorge. My enjoyment of the Gorge, for instance, is impaired by my understanding that Gorge waterbodies are under nearly constant assault by the BNSF coal and petcoke trains.

16. I believe that our action to enforce the CWA, if successful, will stem that degradation and remediate at least some of the damage.

17. The Columbia Gorge itself, and the Friends of the Columbia Gorge as an organization, face enough challenges even in the absence of the BNSF discharges. The unpermitted coal and petcoke discharges by the BNSF trains into Washington waterways must be brought to a close if we are to fulfill our mission to protect the Gorge.

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I declare under penalty of perjury that all of the forgoing is true and correct.

Executed in Portland, Oregon this second day of September, 2013.

Michael Lang

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HON. JOHN C. COUGHENOUR

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON

SIERRA CLUB, a California nonprofit corporation; PUGET SOUNDKEEPER ALLIANCE, a Washington nonprofit corporation; RE SOURCES FOR SUSTAINABLE COMMUNITIES, a Washington nonprofit corporation; COLUMBIA RIVERKEEPER, a Washington nonprofit corporation; FRIENDS OF THE COLUMBIA GORGE, INC., dba FRIENDS OF THE COLUMBIA GORGE, an Oregon nonprofit corporation; SPOKANE RIVERKEEPER; NATURAL RESOURCES DEFENSE COUNCIL, a New York nonprofit corporation,

Plaintiffs,

v.

BNSF RAILWAY COMPANY, a Delaware corporation,

Defendants.

CIVIL No. 2:13-cv-00967-JCC

DECLARATION OF POLLY WOOD IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION TO DISMISS

I, Polly Wood, hereby declare:

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WSBA #38683
Of Counsel, Western Environmental Law Center
2907 S. Adams Street

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1. I am over the age of 18, have personal knowledge of the following, and could competently testify if called as a witness in this legal action. I am aware that Columbia Riverkeeper, Friends of the Columbia Gorge, and other parties have filed a civil action asserting that Burlington Northern Santa Fe (BNSF) has discharged and is discharging coal, coal dust and/or petroleum coke (petcoke) and their byproducts into Washington waters without a permit in violation of the Clean Water Act. Columbia Riverkeeper and Friends of Columbia Gorge represent my interests in this lawsuit.
2. I make this declaration in support of this litigation because I believe it is necessary to protect the water quality of the Columbia River watershed, where I live and recreate with my family, my husband and eight year old daughter.
3. I reside at 525 Highline Road, Hood River, OR, 97031 in Hood River County. I have lived in Hood River for approximately 11 years.
4. I am a retired pastry chef and former business owner of Polly's Cakes and now spend my time volunteering for several organizations in addition to raising my eight-year-old daughter. I am President of the Board of the Hood River Valley Residents Committee, a local land use advocacy organization that works to protect farm and forest land and to promote livability of the Hood River community by upholding the Oregon Land Use laws. I am a Board Member of Friends of the Columbia Gorge. I also work with the Hood River Library Foundation to put on an annual fundraiser for the local library.
5. I am and have been an active member and supporter of Columbia Riverkeeper for nine years, and have donated annually since 2004. On behalf of Columbia Riverkeeper, I provide annual financial support, attend functions, such as fundraising events, participate in letter-writing campaigns, and respond to various electronic action alerts on matters affecting the environmental health of the Columbia River ecosystem.
6. Columbia Riverkeeper is a non-profit organization that serves as the "watch dog" for the Columbia River. The organization looks after the health of our river, monitors its water

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quality, advocates for its protection, and serves as an advocate to prevent activities that threaten the health of our river. As part of its education mission, Columbia Riverkeeper also sponsors trips and outings for those interested in learning more about the river and the wildlife that depend upon the river.

7. I believe that the burning and transportation of coal is one of the most significant environmental problems that our community faces today. I am aware of and support Columbia Riverkeeper's advocacy work on coal. I am aware that Columbia Riverkeeper staff and/or volunteers have worked to gather coal in the river that has been deposited by passing coal trains.

8. I am concerned about the presence of coal, coal dust and petcoke in the Columbia River and the waters that feed the Columbia River because I believe the presence of coal in the water pollutes the water. I also believe that the coal contains contaminants that pose a threat to the health of the species that use and depend upon the Columbia River.

9. I live and own my own home approximately one mile away from the Columbia River. I have a view of the river from my home. I can also see and hear the coal trains as they pass along the river.

10. I believe the presence of coal in our waterways degrades the value of living in this special place. People largely come to visit and live in this community to engage in recreation activities on the water, whether it be swimming, fishing, wind surfing, kite surfing, paddle boarding, or boating. I believe that the presence of coal in the water would make Hood River a much less desirable place to live and visit if the water continues to be contaminated by coal. This in turn will negatively affect the value of my property as well as the quality of my life in Hood River.

11. My recreational interests and activities primarily take place on or around the Columbia River. I visit the river frequently and intend to visit and use the river on a regular basis. In terms of the transportation of coal on railways by BNSF, I am particularly concerned

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about the coal that is deposted into the Columbia River, Klickitat River, White Salmon River, Coburg Beach, Rock Creek, the mouth of the Hood River and Wells Island. Many of the foregoing waterways are places that I visit and use and are impacted by coal and coal dust pollution from the BNSF coal trains because the coal trains pass adjacent and/or directly over them.

12. I regularly engage in bird watching at the mouth of the Klickitat River where it meets the Columbia River. Particularly, my family and I visit this area in January to view the eagles. The presence of coal in the water or on the beach in this area would greatly diminish my enjoyment of this activity and we likely would refrain from coming at all.

13. My husband and I own an Adirondack guide boat that we regularly use on the Columbia River. We usually use it for day trips on the river and will travel from Hood River to other sites along the Columbia River. We frequently travel up the mouth of the White Salmon River, around Koberg Beach, Rock Creek, and Wells Island on the Oregon side. We also intend to visit other areas in the future. When we get to our destination, we pull our boat up onto the shore and thus our enjoyment of this activity would be adversely affected by the presence of coal in the water or on the shore because it would detract from the natural beauty of the area in which we are recreating and pollute the area as well. My family has no desire to recreate in waters polluted with coal.

14. I frequently bicycle along paths that are adjacent to the Columbia River, in The Dalles and along the Hood River waterfront. One of the reasons I enjoy bicycling this route is to enjoy the views of the River. I would be less inclined to participate in this activity if there is coal in or alongside the river where I bicycle.

15. While I do not personally go fishing, my family consumes fish caught in the Columbia River by Tribal fishermen as a way to support our local economy. The coal in the water, and the heavy metals that come from the coal, will contaminate the fish, thereby harming our local economy and the health of my family. I am especially concerned about the

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health of my daughter, as she is young and her system is more susceptible to contamination from heavy metals. Consuming fish caught from the Columbia River is a treasured part of the culture and history of our community, which is being degraded by the coal deposited into the water by BNSF.

16. My family and I regularly hike and picnic in several places adjacent and around the Columbia River. The viewshed surrounding the Columbia River is astounding and the presence of spilled coal in and alongside the river negatively affects the beautiful views that this region has to offer. This negatively affects me as well as our local economy, as many people travel to this area to view the Mighty Columbia and would be less inclined to do so if the river is polluted with coal. Water-based recreational activities, including but not limited to boating, kayaking, swimming, kite surfing, wind surfing, and paddle boarding, are the basis for the Hood River economy and thus the economic health and vitality of my community is especially vulnerable to activities that pollute the water, such as transporting coal in a manner that allows the coal to spill into the river.

17. Studying the wildlife, especially salmonids, is an activity that my family and I regularly do in the Columbia River area. Specifically, we frequently take my daughter to the Rock Creek area to view salmonids swimming up and down the river as they have done for thousands of years. We assist the salmon if they ever get stuck in low water. This is an important circle of life that my daughter is able to witness and this activity is put in jeopardy by the deposition of coal into the Columbia River.

18. My family, especially my daughter, enjoys swimming in the Columbia River. We frequently swim at the waterfront park in Hood River and wherever we park our boat on our trips up and down the River. As a mother, it makes me very uncomfortable to think that my daughter is endangering her health by engaging in a healthy activity such as swimming in her own backyard.

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19. In early April 2013, I personally saw coal on the side of the railroad tracks near the mouth of the White Salmon River. I have also seen coal on the side of the tracks and in the Columbia River near the confluence with the Wind River in June 2013. I did not collect or take photographs of the coal, but it was disturbing to me to see how much coal was spilled into our River.

20. I believe that BNSF's deposition of coal, coal dust and petcoke into the Columbia River watershed has harmed me because coal in the water negatively affects my ability to engage in recreational activities that I enjoy and threatens the health and economic welfare of the community in which I live. I believe that if the court were to issue a decision requiring BNSF to operate in a manner that ensures that no coal or coal dust is deposited into the Columbia River watershed, my interests in preserving my way of life and protecting the environment in my community would be protected.

I declare under penalty of perjury that all of the forgoing is true and correct.

Executed in Hood River, Oregon, on August 30, 2013.

Polly Wood

Polly Wood

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Friends of 2 Rivers

P.O. Box 376 Milltown, Montana 59851 www.friendsof2rivers.org Phone (406) 370-6584

June 10, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

Re: Comment on Millennium Bulk Terminals DEIS

Friends of 2 Rivers, Inc. is an organization of residents living near Milltown, Montana. Our mission is to promote a safe, healthy and enriching environment for the communities at the confluence of the Clark Fork and Blackfoot Rivers. Thank you for this opportunity to provide our comment regarding the proposed coal export terminals near Longview, Washington.

The Proposed Action would create important adverse impacts in Missoula County. Eight loaded and 8 empty coal trains would pass through the County daily. Forty four million metric tons of coal would be exported annually to markets in Asia where it would be burned in coal-fired power plants.

Climate change.

- "The international scientific community is in agreement that human activities have contributed – and continue to contribute – to climate change. One of the primary causes of climate change is the emission of greenhouse gasses…" (DEIS 5.8-2)
- Greenhouse gas emissions – The Proposed Action would annually generate 3,192,548 metric tons of CO2 when the coal is burned in Asia (DEIS Sect 5.8)
- Induced impact – The export of this large amount of coal would lower coal price on the international market and stimulate additional coal consumption and additional adverse climate impact (DEIS Sect 5.8)
- Climate change impacts expected in Washington State will be mirrored in other Pacific Northwest states. An example is the "snow water equivalent," which is forecast to "decline (in Washington State) by almost half (46%) by the 2040s and virtually disappear by the 2080s, greatly reducing streamflow in some areas." (DEIS Sect 5.8.2.4). Climate change impacts resulting from the increase in greenhouse gasses persist for a long period of time, are considered permanent, and are global in nature.
- The emissions attributed to the Proposed Action would be adverse and significant (DEIS Page 5.8-16)

Rail traffic impacts upon neighboring states were not evaluated in the DEIS

Although the DEIS is thorough and well documented for Washington State, impacts outside the State are not considered. While this omission is inherent in an action that is a fulfillment of Washington State law, it is a serious shortcoming in the DEIS process because it ignores impacts upon neighboring states. Impacts of one's actions upon neighbors are essential considerations.

The frequency of Rail accidents in Washington State are estimated in the DEIS using historic data. The observed frequency of accidents on BNSF track in the State is 2 accidents per million miles of train travel (DEIS Page 5.2-4). In Montana, approximately 200 miles of MRL track is adjacent to the Clark Fork River. Eight loaded coal trains/day would travel 1600 miles/day along the River. In a year, train travel adjacent to the Clark Fork would add up to 584,000 miles and be accompanied by the likelihood of 1 accident each year. **Impacts of a coal spill** upon the Columbia River were evaluated in the DEIS and expected to have minor consequence upon the River and aquatic life. The Clark Fork has aquatic geological and biological characteristics very different from those of the Columbia. The adverse consequences of a coal spill into this river are unknown, and could be seriously adverse. "…whether the alterations (from coal released into the aquatic environment) are significant enough to be potentially toxic to aquatic organisms depends on many factors, including the type of coal, the relative amount of time the coal is exposed to water, dilution, and buffering."(DEIS Page 4.7-33)

Delays of emergency vehicles at rail crossings outside Washington State were not evaluated. In our community there are four MRL/BNSF rail crossings, two of which have no alternate road to residential areas. Using the 6,844 foot length of a coal unit train traveling at 50mph for calculation, the 16 trains/day (8 loaded, 8 empty) will add a half hour's delay every day to each crossing. Train speeds at some of these crossings will be slower, adding time to the delay. Local emergency services have had no opportunity to evaluate potential consequences of this added delay, which would be longer if train speeds are slower.

Health impacts of coal dust were evaluated for Washington State only (DEIS Section 5.7). Of special concern were particles 10 microns and smaller, referred to as PM10 sized particles, and those 2.5 microns and smaller, PM2.5 sized particles. PM10 and PM2.5 particles are small enough to penetrate deep into the lungs and may even enter the bloodstream (EPA, https://www3.epa.gov/pm/health.html). Air monitoring equipment operated by Washington State along BNSF main lines detected no exceedances of federal standards.

However, an important shortcoming of the DEIS is the failure to address the long-term health risk over the lifetime of the proposed action (expected to be a minimum 30 year period, DEIS Page 2-11). Clearly, there would be long-term health consequences to residents in the vicinity of rail lines from the liberation of PM10 and PM2.5 particles from 2,920 loaded coal trains traveling each year for 30 years. Evidence that significant particulates are emitted from coal trains is bolstered by the existing need to re-apply surfactant topper agents one additional time during transport from the Powder River origin to the Longview, Washington destination. The extremely small size of PM10 and PM2.5 particles (the human red blood corpuscle is 7 microns in diameter) makes them invisible, broadly dispersible into the human environment, and present as an undefinable and adverse long term impact upon human health.

Friends of Two Rivers strongly recommends the "No Action Alternative" (The Proposed Action to export coal from the Longview Terminals would not take place) because of:

1. The intolerable impact upon climate of increased greenhouse gas emissions resulting from the Proposed Action.
2. The failure of the DEIS to address significant impacts of the Proposed Action upon neighboring states.

Thank you for this opportunity to comment.

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Submission Number: ***TRANS-LV-M2-00016***

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Commenter: Lauren
Organization: Greenpeace
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

My name is Lauren. I am a representative of Greenpeace keeping our planet green and beautiful. We understand that we need jobs and people need money for their families, but there are alternatives to be used, and if we continue building coal terminals, those alternatives will not be pursued.

Our wind industry actually offered more jobs than our coal mining industry. Building this terminal offers a small number of permanent and temporary jobs. But at what cost? In the long run our environment is really what sustains us. We need to stand up for our Mother Earth and phase fossil fuels out to promote a healthier and greener future. Please don't build the terminal.

Thank you.

Submission Number: ***TRANS-LV-M1-00023***

Received: 5/24/2016 12:00:00 AM
Commenter: Den Mark Wichar
Organization: Houck Neighborhood Association
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

I'm Den Mark Wichar, science teacher, representing Houck Neighborhood Association in Vancouver. Extensive study by scientists at Stanford and UC Berkeley emphatically shows that the nation can be totally energized by renewables. Thirty states, including Washington, are singled out as could be supplied 100 percent by wind, water, and sunlight by 2015. Yet we have before us the EIS for Millennium's proposed coal terminal. Overwhelming the complex nature of the proposal is even more obvious when laid out on so many pages. So overwhelming that the combined abilities of the Port and Millennium are no match. But specific references to communities along the route of the requisite coal trains one after another after another. Miles of them every day for years and years. Reference to our effected communities are few and vague in this EIS. The Port and corporations still believe that they can do what they want without regard to affecting people along hundreds of miles of track, without regard for anyone on this planet. I do not know how more clear it can be that we oppose this project, that it is toxic for everybody environmentally, medically, culturally, socially, economically. And my message to those who talk only about jobs, this project is not the only way to create jobs. I expect this proposal will be absolutely turned down unless people have lost all ability to think. Millennium's proposal makes no sense. The region we live in is much bigger than Cowlitz County. People who live outside of this county have something to say. Bury this proposal in the ground where coal and such projects should remain. Our state could be 100 percent sustainably energized by 2050. That is where we should be headed, toward 2050. Not 1850, not 1550. 2050.

RECEIVED
JUN 07 2016

www.idahoconservation.org

Idaho Conservation League
PO Box 2308, Sandpoint, ID 83864
208.265.9565

June 7, 2016

RE: Comments on Millenium Bulk Terminals-Longview

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave., Suite 550
Seattle, WA 98104

Dear Washington DOE, USACE and Cowlitz County Commissioners,

I'm submitting these comments on behalf of the Idaho Conservation League. Since 1973, the Idaho Conservation League has been Idaho's voice for clean water, clean air and wilderness—values that are the foundation for Idaho's extraordinary quality of life. The Idaho Conservation League works to protect these values through public education, outreach, advocacy and policy development. As Idaho's largest state-based conservation organization, we represent more than 25,000 supporters, who have a deep personal interest in the health and safety of their families, as well as the clean water, clean air and extraordinary quality of life that Idaho has to offer.

We believe that the proposed Millenium Bulk Terminals-Longview Project will have a detrimental effect on the health, safety, environment and quality of life for the thousands of people who live along the Montana Rail Link and BNSF rail lines that carry Powder River Basin coal through Idaho. And while we recognize that the U.S. Army Corps is taking a narrow scope in this review, and that the Department of Ecology and Cowlitz County are Washington state entities, we urge you to consider the impacts of this proposal beyond the state's borders. Many of our concerns are similar to those of Washington state residents who also live along the rail lines that will carry coal to this terminal. One key difference is that while Washington state may enjoy some economic benefits from the proposal – job creation at the terminal site, for instance – Idaho will enjoy none of those benefits. We are left with the risks alone.

We urge you to choose the No Action alternative for the following reasons:

1) Risk of derailment and spills: The DEIS predicts more than 11 rail-related accidents every year across the state of Washington, and 19 coal train accidents annually when other projects are considered. These numbers do not consider the potential number of accidents that could occur in Idaho or Montana. Unlike Washington State, Idaho is uniquely reliant on BNSF and the other railways to conduct adequate inspections of their railroad tracks. Idaho has none of its own track inspectors. The only independent track inspector, employed by the Federal Railroad Administration, covers all of Idaho, Eastern

Washington and Montana. Furthermore, coal dust escapes onto the tracks creating additional maintenance concerns for the railroad. The validity of coal dust concerns has been confirmed by the work of Daniel A. Jaffe at the University of Washington, whose 2014 study showed a distinct pattern of coal dust emissions from Powder River coal trains in the Seattle area.[1] We have heard anecdotal evidence that people who live next to the tracks in Hope, Idaho, find coal dust gathering on their windowsills. That dust also settles into ballast of the rail lines.[2] This causes maintenance problems for the tracks and can lead to derailments. As coal train traffic increases, we increase our odds of a derailment. Idaho and Montana will not receive any additional funds from this project to mitigate for this lack of scrutiny.

The federal government has predicted 10 derailments per year of trains carrying highly volatile cargo such as Bakken crude oil, which travel these same tracks. The study estimated a severe accident could cause $6 billion in damages and kill 200 people in a populated area.[3] An oil train derailment would be catastrophic, as well, in the more rural North Idaho. There also can be no way to mitigate for an explosive oil train derailment if it were to happen in one of Idaho's rural communities, where many homes, businesses and schools are in the blast zone.

2) Risk to Waterways: North Idaho is known for its abundance of lakes and rivers. Because of the way the railroads were developed, railroad tracks were often built adjacent to lakes and rivers, putting our waterways in harm's way. Most of the coal that comes through Idaho travels on Montana Rail Link's route, which follows the Clark Fork River and the north shore of Lake Pend Oreille.

Lake Pend Oreille is critical habitat for bull trout, a threatened species, and also is the water sources for the cities of Sandpoint and Priest River, not to mention dozens of individual homeowners who draw their water from the lake or river. Coal is already being found in the waters and shores of Lake Pend Oreille, as chunks of coal spill off the tops of open rail cars. Coal contains many heavy metals that are harmful to aquatic and human life. It's unclear how either the gradual cumulative build up of coal dust and chunks in the waterways, or a catastrophic spill, might effect the chemical environment of the lake. Cleaning up a spill from a derailed coal train would be a difficult proposition, if not impossible. If a spill were to happen in Lake Pend Oreille in the winter, response time would be complicated by the low lake level and the fact that few boat launches are available to get response teams into the water.

3) Health impacts:

- The additional trains will adversely affect the health of people living near the tracks. Diesel fumes are particularly harmful for vulnerable populations.[4]

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[1] Jaffe, Daniel A., Greg Hof, Sofya Malashanka, Justin Putz, Jeffrey Thayer, Juliane L. Fry, Benjamin Ayres, and Jeffrey R. Pierce. "Diesel Particulate Matter Emission Factors and Air Quality Implications

[2] "BNSF Coal Dust FAQs." *Coal Train Facts RSS*. N.p., 2011. Web. 09 Sept. 2015. <http://www.coaltrainfacts.org/docs/BNSF-Coal-Dust-FAQs1.pdf>.

[3] Brown, Matthew. "Fuel-hauling Trains Could Derail 10 times a Year in U.S., Report Says." *The Spokesman-Review* [Spokane, WA] 23 Feb. 2015: Print.

[4] Abbott, Dale, MD, and Et Al. "Whatcom Docs Position Statement and Appendices." *Coal Train Facts RSS*. Coal Train Facts, 08 Mar. 2011. Web. 10 Sept. 2015.

- Many communities also are impacted by the noise pollution caused by the requirement of trains to sound whistles at crossings. To address this problem, Sandpoint has recently allocated $60,000 from its budget to install whistle-free safety devices at two crossings in the city, but cannot afford to equip all crossings with the devices. Other smaller communities, such as East Hope, ID, and Athol, ID, have similar noise concerns, but cannot afford to install the equipment on even one crossing to reduce the sound pollution.
- Coal dust is a real problem. Anecdotally, we know people in the Hope, Idaho, area have experienced coal dust build up inside their homes, and recent University of Washington studies confirm that dust escapes from coal cars. We know that coal contains toxic metals such as mercury and lead, and that it causes severe lung problems in miners. We don't have enough studies to determine how serious health effects are when coal dust is combined with diesel fumes in the vicinity of railroads. We are concerned, also, that this Draft EIS was released prior to the completion of the health impact assessment that was commissioned by the state in order to inform this process. There are too many unanswered questions regarding health impacts to approve this facility.

4) Traffic Concerns: Rail traffic is expected to dramatically increase from both Bakken oil trains and coal trains through North Idaho. North Idaho has dozens of unprotected at-grade crossings. The increase in trains will mean more tragic accidents at crossings as impatient drivers try to "beat the train." Additionally, stopped traffic at at-grade crossings means delays for emergency vehicles, making a life or death difference for waiting patients. Traffic delays are expected to increase by 1 to 3 hours per day from increased coal train traffic if the Millenium Bulk Terminals-Longview project is built.[5] Many at-grade crossings will need improvements to deal with the increased traffic. Our local and state jurisdictions simply do not have the funds to pay for overpasses and underpasses. Unless required as a mitigation measure, railroads are not required to pay for crossing improvements, leaving taxpayers footing the bill for essential safety infrastructure made necessary by this industrial expansion.

5) Economic Impacts: In Sandpoint, expanded rail traffic will result in a negative impact on the economy. Using DOT's guidelines, the City of Sandpoint has computed that the current wait time impact on our local economy is about $350,000 per year. With no change in traffic or rail crossings the city could reach well over $1 million in total loss in just four years, according to the City of Sandpoint's analysis. Increased train traffic impacts the flow of goods and services. As delay and isolation increases, business owners may decide it is no longer feasible to operate here. Contemporary research indicates that significant increases in train traffic can reduce property values of residential homes within 750 feet of the track by as much as 5 to 7 percent.[6] With the multiple fossil fuel projects now in the permitting process, homeowners could lose an average of $8,000 in home value. As a community, this would represent about a $2 million loss of taxable

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[5] De Place, Eric. "The Wrong Side of the Tracks." *Sightline Daily*. Sightline Institute, 12 Sept. 2013. Web. 11 Sept. 2015. <http://daily.sightline.org/blog_series/wrong-side-of-the-tracks/>.

[6] Robert A. Jaouhari Simons, and Abdellaziz El. "The Effect of Freight Railroad Tracks and Train Activity on Residential Property Values." *Appraisal Journal* 22 June 2004.

value.[7] We already have anecdotal evidence of lost economic opportunities from the proposal to haul millions of tons of coal through our community. A local Realtor has testified before the Sandpoint City Council that proposals to build coal export terminals on the West Coast cost him the sale of a home in the otherwise higher end Ponder Point neighborhood near the Montana Rail Link tracks. It is reasonable to expect further lost property sales in the face of expanded coal shipments through our communities.

6) Climate Impacts: Building this facility will add massive amounts of carbon annually to the earth's atmosphere. The Draft EIS estimates that building this terminal will result in up to 27 millions tons year of carbon dioxide being released into the atmosphere per year – which would make it one of the largest emitters of carbon dioxide in the state of Washington. In Idaho, like many western states, we're suffering severely from drought and wildfires, both the results of climate change. Last summer, we struggled through multiple days of air quality labeled as "hazardous" in various communities throughout North Idaho due to multiple large wildfires. One of our most popular whitewater rivers – the Main Salmon – was closed to boaters due to wildfire danger. National forests around North Idaho were closed to hikers, campers and hunters. Many homes and lives were lost last summer due to wildfires. Our winters are shorter and our snowpack less, and winter and spring floods are more intense. While our snowpack in North Idaho was normal this past winter, April was one of the hottest years on record and the runoff was swift, leaving us again the potential for a hot, dry, dangerous fire season. Given this context, the addition of 27 million tons of CO2 to our atmosphere annually will only exacerbate these issues particularly at a time when we need to be reducing CO2 emissions.

In conclusion, we do not believe these impacts can be mitigated, and therefore we urge you to choose the "No Action" alternative.

Thank you for the opportunity to comment.

Sincerely,

Susan Drumheller
Idaho Conservation League
P.O. Box 2308
Sandpoint, ID 83864
sdrumheller@idahoconservation.org
(208) 265-9565

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[7] Yost, Jared. *Economic Impact of Increased Rail Traffic through Sandpoint, Idaho*. Rep. Sandpoint, ID: City of Sandpoint, 2015. Print.

Submission Number: ***TRANS-LV-M2-00026***

Received: 5/24/2016 12:00:00 AM
Commenter: Jason Lundquist
Organization: ILWL21
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good evening. And thank you. I'm Jason Lundquist (phonetic), representing ILWL21, Longview, Washington. I live here and so do the brothers and sisters of ILWL21, many of -- some of which are fourth-generation workers here.

A sufficient study has recently been released after four years of which 3,000 plus pages of information has been put forth. From that information there's a lot of facts. I'm envious of you folks. I'm envious of the fact that you get to read through the facts, look at information, and you get to take that information, and you get to make the right decision.

You can help the governor right what may be his wrong. This community is in desperate need of these jobs, family-wage jobs, money of which are important for this community and this state. We love the smell of money.

I had the opportunity to tour one of the largest coal facilities in the world in New Castle, Australia. I was there for -- to bear witness to what a coal facility looks like. I was there to see how the community lives and works near to that facility.

I'm hoping that, and with your help, that you may also be able to tour that facility, because there's nothing like seeing something as it looks.

So, please, I ask and I implore you to take a look at the facts. Take a look at exactly what is necessary for this community to understand that the impacts have been put forth before you, and we're looking forward to you to make the right decision.

Thank you.

Industrial Energy Consumers of America
The Voice of the Industrial Energy Consumers

1776 K Street, NW, Suite 720 • Washington, D.C. 20006
Telephone (202) 223-1420 • www.ieca-us.org

June 10, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave, Suite 550
Seattle, WA 98104 4

Re: Millennium Bulk Terminals-Longview SEPA Draft Environmental Impact Statement

On behalf of the Industrial Energy Consumers of America (IECA) and our Washington State member companies, we are writing to express deep concern regarding actions by the Washington Department of Ecology and Cowlitz County to recommend or require the Millenium Bulk Terminal, to be accountable for not only the local environmental impacts of the port expansion, but also the global environmental footprint of the cargo. We are very concerned that this could set a precedent for all other product exports

IECA is a nonpartisan association of leading manufacturing companies with $1.0 trillion in annual sales, over 2,900 facilities nationwide, and with more than 1.6 million employees worldwide. IECA membership represents a diverse set of industries including: chemical, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, building products, automotive, brewing, independent oil refining, and cement.

The potential precedent of requiring the exported product to account for the environmental footprint will significantly and negatively impact the exports of manufacturing products. U.S. manufacturers already have a significant time competing with foreign competitors. According to the Bureau of Economic Analysis (BEA), in 2016, the manufacturing trade deficit stands at $627 billion. All manufacturing products include an environmental footprint.

IECA urges the agencies to issue final permits for this project and importantly, remove language related to the mitigation of emissions from goods being shipped through the terminal.

Sincerely,

Paul N. Cicio
President

Submission Number: ***TRANS-SPOKANE-M1-00066***

Received: 5/26/2016 12:00:00 AM
Commenter: Gary
Organization: International Association of Machinists and Aerospace Workers
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

My name is Gary. I'm speaking on behalf of the International Association of Machinists and Aerospace Workers representing 48,000, mostly Boeing workers in Washington State. I rise in support of the Millennium Bulk Terminal project.

This project has the ability to repurpose a former Alcoa plant, a brown field, if you will, into a vibrant economic entity providing thousands of living-wage construction jobs and hundreds of direct union-wage operational jobs.

The construction along this terminal is estimated to generate 40 million dollars in state and county tax revenues with operational tax revenue estimated to be another five million dollars annually. All the while no taxpayer dollars will be used with the entire venture being funded and invested by industries that will use the facility to export their goods and services. This terminal, state of the art infrastructure, will be built with the unique opportunity to boost our economic trade growth with the Asian Pacific Rim countries in particular, by also shipping and exporting such products as apples, grains, wood products, aluminum, and others so critical to our dependent state's business model.

Our review has shown, and make no mistake about it, that the Canadian government, British Columbia in particular, is just chomping at the bit to have this entire project, all of its jobs and revenues that come with it to move up the road and across the border where their ports are already running at 100 percent capacity and where they regularly turn away businesses right now. They truly do understand the economic impact of this rapidly extending waterway commerce.

Our review further includes the current permitting process on this project is overly cumbersome and has been waiting approval for over three years already. We feel that this infinite timeline to review could be perceived as a harsh or an inhospitable business climate for both the investors and job creators and all the community services, skilled workforce of Washington and its economy.

Therefore, we plead for a reasonable and structured finite timeline for you to review this project, and we ask for your support. Thank you.

Submission Number: ***TRANS-SPOKANE-Q1-00006***

Received: 5/26/2016 12:00:00 AM
Commenter: Steve Holt
Organization: Lake Pend Oreille Waterkeeper
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
My name is Steve Holt. I am currently president of the board of the Lake Pend Oreille Waterkeeper. The Waterkeeper's mission is relatively simple. It's to protect the waters of Lake Pend Oreille and its tributaries and try to keep them swimmable, fishable, and drinkable for generations to come.

While we have many concerns around the increased coal train traffic for our community, Sandpoint and Bonner County, I'm here to focus on one in particular, and that's water quality. It is the opinion of our organization that the DEIS does not adequately address concerns around coal dust.

We have pictures of trains with large quantities of coal dust coming off of them. There are ten river and lake crossings in our jurisdiction alone and coal from existing coal trains is currently being discharged into Lake Pend Oreille and is currently a violation of the Clean Water Act.

So threats of derailment into our water body are significant and it is of tremendous concern. So wrapping up, I'd like to encourage you all to seriously consider the impacts on all the rail communities between mine and port.

Thank you.

Submission Number: ***TRANS-LV-Q3-00028***

Received: 5/24/2016 12:00:00 AM
Commenter: Mary Lyons
Organization: Landowners and Citizens for a Safe Community, President
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
My name is Mary Lyons. I live here in Longview. I am president of LCSC, Landowners and Citizens for a Safe Community.

And I'm going to read my full testimony that I missed.

In June of 2014, Wyoming Governor Matt Mead a man who has declared I'm completely unconvinced that climate change is man-made, came to Washington to pressure Governor Insley to support dirty coal terminals.

In a 2015 report entitled The Impact of the Coal Economy on Wyoming, at the University of Wyoming, Laramie, there are pages and pages of concerns about the dismal future of the coal industry. And the last recommendation in the document is, more important will be whether Wyoming can influence other states to implement carbon control strategy least detrimental to Wyoming's coal industry.

So it looks to me as our governor is being played to benefit the coal industries of Montana and Wyoming rather than the citizens of a very green Washington he was elected to represent and protect.

Do we now have a shared governance with those two states which oversees conglomerates and government benefiting at our expense?

One underlying question of this entire coal controversy is, whose governor is he?

The coal dust to the terminal itself coated not with surfactant but simple water is predicted to layer neighboring homes, schools, and play fields, and is described as a nuisance. At what point in time does exposure to coal dust transition from nuisance to deadly? After five years? Ten? Fifteen?

Has the Department of Ecology looked at any credible scientific studies that will answer that question definitively? Whose Department of Ecology are you?

Children will die from this incidental nuisance and the diesel particulates delivered along the route. It is our local children's health I am particularly advocating for today. But it is all children's health we will continue to fight for as this battle rages on.

I declare on behalf of our LCSC members that they are all our children and we urge a no action alternative as the only safe and compassionate choice for their lungs and lives. Thank you.

I want to also agree with a couple of other people who have testified about the cost of the upgrades to the rail and if the rail has to be upgraded in order to accommodate these trains. Then what kind of time frame are we really looking at before this terminal can open with those 18 trains a day, and whether or not Millennium is going to pay for the upgrade of the rails, whether or not Burlington is going to pay for the upgrade of the rails, or are the taxpayers going to pay for the upgrade? And when will it happen and how will it fit in to the opening of this terminal? Thanks.

Submission Number: ***TRANS-PASCO-M1-00040***

Received: 6/2/2016 12:00:00 AM
Commenter: Mary Lyons
Organization: Landowners and Citizens For a Safe Community
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

My name is Mary Lyons (phonetic). I live in Longview. I am a member of the LCSC, Landowners and Citizens For a Safe Community, which is a grassroots organization opposing this coal terminal. We oppose this terminal and the accompanying trains.

Experience has shown large volumes of coal dust and chunks are lost from moving cars and the surfactants is ineffective over long distances and has greatly diminished approaching Pasco. If BNSF and Millennium acknowledge the need for surfactants here in Pasco, what about the communities and agricultural areas just north of Pasco? On rainy days like today, will those communities and crops be covered in dust and communities west of Pasco be fine?

A little bit of arsenic in coal dust is similar to a little bit of cancer. Extremely fine dust from Powder River Coal is invisible like dust from our charcoal grills. It is so fine it takes four molecules, the width of a human hair, and easily enters our lungs and lungs of our children along the route. Crops and water life will suffer. Reversing the direction of this debacle will be extremely expensive to mitigate and drive this economy into another downward spiral. We are Washington. We share this river. And coal is a commodity we can do better without.

As I was driving by I84, I was impressed with the apples and grapes across on the Washington shore. Why are we gambling on the unknown risk that Wyoming, Montana and the Pacific Rim country has decided to engage? We demand no action on this proposal. We know better, we have done better, and we'll continue to do better.

Thank you.

Submission Number: ***MBTL-SEPA-DEIS-0001743***

Received: 6/2/2016 12:13:53 AM
Commenter: Jayne Freudenberger
Organization: League of Women Voters of Bellingham/Whatcom
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Comment on the Millennial DEIS: The DEIS says the health related fears of coal dust is legitimate if you live near the terminal or the 16 additional trains that will traversing our state each day bringing the coal from the mines to the proposed terminal. Even under good conditions the average 125 open top trains will emit 12,125 lbs. of coal dust in just over 400 miles of travel. (Jaffe Study Nov. 2015). Furthermore, just this week, Dr. Joel Kaufman from the University of Washington published findings on a study that correlated increased heart disease with pollution These findings are enough to make us question the wisdom of this project and the wisdom of the drafters of the DEIS in not analyzing emissions from current coal terminals. In the EIS the stated figure for PM 10 is 7.08 tons of pollutant for the Millennial terminal: yet a terminal in operation with all the known dust suppression equipment available , the Hay Point Terminal in Australia which exports 44 million tons of coal a year, self -reports a PM 10 emission rate of 154 tons. Either the proponents of Millennial are lying or sadly mistaken. Where are the comparison figures of other like facilities in the DEIS? Add to this the lack of market in China and the Far East. Is this a case of build it and hope the market will rebound? Wait, China is not only cutting its coal imports, it is drastically cutting its number of new factories and let's not forget China has far more coal than it needs and is closing an additional 1000 coal mines a year. Imagine building this dinosaur and then having the environmental cleanup in our hands when it goes bankrupt. Speaking of which, the coal companies that back this project are all in bankrupt proceedings. Not only will they not pay creditors, they are reneging on promises for retiree health care and the outlook for pension benefits is dim. Our planet is reeling under the effects of Climate Change already—the catastrophic events—more hurricanes, tornadoes, drought and warming oceans have begun. The time to reject any more burning of fossil fuels is now: our efforts should reach toward renewable energy sources and a fight to save our world for our grandchildren. Submitted by: Jayne Freudenberger for the The League of Women Voters Bellingham/Whatcom County

Submission Number: ***MBTL-SEPA-DEIS-0002535***

Received: 6/11/2016 7:07:13 PM
Commenter: Ann Murphy
Organization: League of Women Voters of Washington
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Maintaining a sustainable and hospitable environment is a major priority for The League of Women Voters of Washington. The League of Women Voters of Washington believes that the “no action” alternative in the Millennium Bulk Terminals Draft Environmental Impact Statement (DEIS) should be selected. There has been more than sufficient evidence presented that this project is neither in the best interests of the citizens of Washington State (especially the residents of Longview and communities along the rail route) nor of the overriding cause of lowering the global carbon footprint in time to prevent the most catastrophic impacts of climate change. While some have argued that the relatively cleaner coal exported from the U.S. exported to China would replace locally mined, dirtier fuel, we do not believe there is any assurance that coal demand would not rise as lower grade (and more polluting) domestically mined coal in China (and other receiving countries) became cheaper to purchase. We believe this facility would risk adding substantially to the global climate footprint, and that this is a risk that must not be permitted. We understand that energy pricing and market elasticity are very complex; short of a functional and enforceable global system of carbon pricing, it is a safe assumption that more fossil fuel extraction, processing and export will worsen the global carbon footprint. The Draft EIS identifies significant impacts on human health and the environment, and suggests mitigation measures without persuasive evidence that any such measures would be feasible, affordable, or effective. The Final EIS should make sure that all discussions of mitigation options are presented with full acknowledgement of their limitations should they be employed, and an analysis of mechanisms for enforcement. It should also assess means of assuring that all attendant costs of mitigation would be borne by the operators, not by the public. Research by the Sightline Institute (http://www.sightline.org/2016/05/04/coal-trains-mean-coal-dust-period/) and others demonstrates the unlikelihood of significant mitigation measures being realized, thus reinforcing our conviction that the "no action" alternative should be selected. Ann Murphy, President League of Women Voters of Washington

Submission Number: ***TRANS-LV-M1-00006***

Received: 5/24/2016 12:00:00 AM
Commenter: Peggy Bruton
Organization: League of Women's Voters of Washington State
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Peggy Bruton. I live in Olympia. And I was asked to just speak for a moment on behalf of the League of Women Voters of Washington State. The league is a national organization with state leagues and local leagues. We have a number of these all over the state of Washington. And the league, at the national level, puts a very high priority on environmental protection, confronting climate changes, one of the very most urgent concerns of the league. And so as a state league -- and a longer statement has been submitted by our president, so I'll just say a few words about that. Our major concern is the worsening of global warming. I know that there's been an argument that the clean -- relatively clean coal will be replacing dirtier coal in China and that there will be these sort of price things that will drive down the use of coal. I think that that has been widely refuted, or at least severely questioned. I don't think anybody can make such an assumption. It stands to reason that the more coal is taken out of the ground the more coal is going to be used. And also the cost of transporting that coal can't be ignored. It borders on the absurd. In fact -- and this is a personal statement on my part I find it absurd at this point that we're even arguing about this, when on a daily basis we're finding out that we have a shorter and shorter window when we can do anything at all to avert disaster. Why are we even talking about more coal? Thank you very much.

MARITIME FIRE & SAFETY ASSOCIATION

Columbia and Willamette Rivers • Oregon and Washington

June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave, Suite 550
Seattle, Washington 98104

via: CommentWorks website

Re: Draft Environmental Impact Statement (DEIS), Millennium Bulk Terminal (MBT)

To Whom It May Concern:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the Millennium Bulk Terminal Project.

The Maritime Fire & Safety Association (MFSA) is the leading provider and advocate of safe, environmentally responsible and cost effective response services in the Columbia Willamette River Marine Transportation System. The MFSA is a not-for-profit association that supports three programs that are referenced in the DEIS and are part of the regional response structure – the MFSA Vessel Response Plan (the Plan), the Fire Protection Agencies Advisory Council (FPAAC) and our VHF Microwave Digital Radio System.

- The MFSA Plan is a state approved umbrella plan first developed in 1993 to provide an effective and cost efficient way for ships to meet the regulations of Oregon and Washington, which go above and beyond federal regulations for oil spill planning and response. It provides the resources necessary to meet state planning standards from three miles beyond the mouth of the Columbia River up to river mile 113 and on the Willamette River from its confluence with the Columbia to the Willamette Falls.
- FPAAC was established in 1983 to address the need for a coordinated focus by local fire agencies with commercial marine ports to develop programs, training and equipment caches that improve the ability of any one agency to respond to a shipboard fire in their jurisdiction through their relationships and mutual aid agreements.
- MFSA maintains a VHF microwave digital radio communications system in concert with the Merchants Exchange of Portland (MEX). This system supports both of these programs by ensuring that reliable radio communication is available throughout the river system – both VHF channels used by the maritime industry and private command and tactical channels for use during an incident.

The MFSA has reviewed the published DEIS for the Millennium Bulk Terminal Project and respectfully submits the following comments.

There were a variety of statements in the Vessel Transportation section of Chapter 5 we'd like to address:

LOCATION	INFORMATION FROM DEIS	COMMENT
5.4-22, Pilotage	*Document refers to the Columbia River Harbor Safety Plan.*	The correct name of the document is the **Lower Columbia Region Harbor Safety Plan**.
5.4-32, Marine Oil Spill Survey		*This section provides a narrative description of types and severities of oil spills during the reported time period. It should identify the vessel type that was the source of the spill, as was done in Table 5.4-11*
5.4-32, Marine Oil Spill Survey	*The section presents detail on International and Federal planning and prevention legislation.*	Please include reference to Oregon and Washington's planning and response laws.

As the MFSA's main role is to provide Incident Management and Response, the bulk of our comments are directed at section 5.4.4.5 Incident Management and Response Systems. For simplicity, we have provided a redlined version of that section below with our recommended changes.

5.4.4.5 Incident Management and Response Systems

The National Contingency Plan, codified in 40 CFR 300, establishes federal on-scene coordinators for oil spills and hazardous material releases within the inland zone and coastal environments. The plan is the foundation document for state, regional, and local planning for pollution response and provides organizational focus for the related emergency situations that linked to oil spills such as vessel groundings, collisions, allisions, and fires.

USCG is the federal on-scene coordinator in the study area. In Washington State, Ecology is the designated state on-scene coordinator for spill response. The Washington Emergency Management Division functions in this role for natural disasters, and Washington State Patrol or state fire marshal for fires. The Washington State Emergency Response system is designed to provide coordinated state agency response, in cooperation with federal agencies for effective cleanup of oil or hazardous substance spills. Within Oregon, ODEQ is the lead agency for oil or hazardous material spills, the Oregon Office of Emergency Management coordinates support from other state agencies, and the state fire marshal provides hazardous materials/fire incident response coordination and support when a situation exceeds local response capabilities.

The Northwest Area Contingency Plan is the regional planning framework for oil and hazardous substance spill response in the states of Washington, Idaho, and Oregon. Representatives from the federal and state agencies listed above and local governments plan for spill response emergencies and implement response actions according to the plan when an incident occurs.

The plan includes but is not limited to the following elements.

- A description of the area covered by the plan, including the areas of special economic or environmental importance that might be damaged by a spill.
- Roles and responsibilities of an owner or operator and of federal, state, and local agencies in spill response and in mitigating or preventing a substantial threat of a discharge.
- A link to an online list of equipment ~~(including firefighting equipment) and personnel~~ available to respond to oil spills.
- Site-specific geographic response plans.

Geographic response plans, part of Northwest Area Contingency Plan, are tailored for specific shorelines and waterways. The main objectives of these plans are to identify sensitive resources at risk from oil spills and to direct initial response actions to sensitive resources.
In addition to the national and regional plans, the Lower Columbia Region Harbor Safety Committee maintains the Harbor Safety Plan, which includes incident management guidelines; emergency communications; notification requirements in case of an oil spill; steps to take in case of a vessel grounding, vessel collision, bridge allision, and mechanical or equipment failures.
All of these plans help coordinate response efforts by the responsible party (vessel owner/operator) and federal and state agencies.

Owners/operators of large commercial vessels are required to prepare and submit oil spill response plans under federal (33 CFR 155.5010-155.5075) ~~and state requirements (WAC 173-182)~~ to ensure that resources, including equipment, are in place for a spill of the vessel's fuel oil and of any oil carried as secondary cargo. Moreover, vessel owners/operators are required to retain an oil spill removal organization and a spill management team; this is often accomplished by contracting with cooperative organizations that specialize in oil spill response, such as the Marine Spill Response Organization and National Response Corporation.

Additionally, vessels owners/operators calling the Lower Columbia/Willamette Rivers must have an approved vessel response plan that meets both Oregon and Washington state regulations (OAR 340-141) (WAC 173-182) with requirements that go beyond the federal regulations. Vessels can obtain oil spill response and contingency planning coverage that meets these state requirements under the Maritime Fire & Safety Association (MFSA) response plan, an umbrella plan for enrolled vessels entering the Columbia River.

The incident response system in the study area for vessels covered by the MFSA response plan is described below for oil spills, fires, and collisions and groundings.

- Oil spill. If an oil spill occurs in the study area, USCG, Ecology, and ODEQ—the federal and state on-scene coordinators—and the responsible party (RP) represent the Unified Command. MFSA represents the RP for up to the first 24 hours after an event to ensure an immediate response. The Unified Command coordinates responses, mitigation, and cleanup efforts for spills on the Lower Columbia River to protect public health and safety, response personnel, and the environment. (Maritime Fire and Safety Association 2013)

- Shipboard fire. Under the Federal Fire Prevention and Control Act of 1974, fire prevention remains a local and state responsibility (Northwest Area Committee 2015). The local fire jurisdiction is the first responder to a shipboard fire. If the incident is beyond the local jurisdiction's capacity, mutual aid resources are requested. Through the MFSA Fire Protection Agencies Advisory Council (FPAAC) the mutual aid network extends to thirteen (13) fire agencies along the Lower Columbia/Willamette Rivers. If local and mutual aid resources are exhausted, the local fire chief requests assistance from the state emergency management office. With appropriate approvals, the state fire chief (Oregon) or state fire marshal mobilization coordinator (Washington) takes control over response (Office of State Fire Marshal 2015; Office of the State Fire Marshal, Washington State Patrol 2015). The USCG COTP acts as the federal on-scene coordinator, if a shipboard fire occurs outside a fire agency's jurisdiction but within the Sector Columbia River COTP zone, or if a vessel fire is treated as a search-and-rescue case (Northwest Area Committee 2015).

- Collision and grounding incident response. For collision and grounding incidents, the vessel operator immediately secures watertight closures and contacts the USCG COTP ~~and~~ Ecology and DEQ. The USCG COTP may establish a communications schedule, request periodic vessel updates, and issue a safety marine information broadcast. In response to a collision, USCG response personnel and state investigators assess and supervise the incident and may form a Unified Command. Unified Command instructs responsible parties on separating joined vessels and moving vessels to anchorage. The USCG COTP works with the vessel operator and Unified Command to initiate pollution response, as necessary. In most cases, a surveyor is required to inspect damage and verify repairs. In response to a grounding, the objective is to refloat and minimize damage to the vessel and environment. When the vessel floats free, the responsible party ~~will~~ may be required to activate the response plan to minimize any pollution threat, at the discretion of Unified Command.

LOCATION	INFORMATION FROM DEIS	COMMENT
Table 5.4-16	*This table, providing anticipated collision frequencies of certain spill volumes.*	The column indicating volumes is confusing. Should they be listed as: 20,900 or less 59,300 to 20,899 107,400 to 59,299 166,500 to 107,399

The creation of an Environmental Impact Statement on a project of this magnitude is an immense task. We appreciate the work and effort that goes into locating data, reviewing scenarios and researching potential outcomes of various possible impacts. We support the development of

plans and processes that will ensure public safety and minimize potential negative environmental impacts that may be associated with industrial facility siting. We request that the final EIS reflect the technical corrections and recommendations provided by experienced industry stakeholders.

We look forward to continuing to work with Millennium Bulk Terminals to help ensure the project meets the critical needs it is designed to serve in a way that protects the public health, safety and our precious environment.

Sincerely,

Elizabeth Wainwright
Executive Director

Ross E. Eisenberg

Vice President
Energy & Resources Policy

June 13, 2016

MBTL SEPA Draft EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

Re: Millennium Bulk Terminals-Longview SEPA Draft Environmental Impact Statement.

The National Association of Manufacturers (NAM), the largest manufacturing association in the United States representing manufacturers in every industrial sector and in all 50 states, submits the following comments to the Cowlitz County Department of Building and Planning and the Washington State Department of Ecology (the Agencies) on the Draft Environmental Impact Statement (EIS) under the State Environmental Policy Act (SEPA) for the Millennium Bulk Terminals – Longview (MBTL) coal export terminal.

MBTL is reinvesting in an underutilized 416-acre site, upgrading what was a 1940's era aluminum smelter, and removing and recycling over 300,000 tons of waste from the site. The proposed redevelopment of this facility would create a coal receiving, storage and shipping terminal bringing a private investment of over $680 million dollars into the area. MBTL will generate millions of dollars in economic output in Washington and the Pacific Northwest, creating 2,650 direct and indirect jobs in the region during its construction phase and over 300 long-term jobs in the community.

The NAM strongly supports timely construction of the MBTL project. Export projects like MBTL are vital to the success of domestic manufacturing and job creation. Currently, ninety-five percent of the world's consumers live outside the borders of the United States. To find new customers, grow jobs domestically and improve our country's competitiveness, manufacturers must modernize our export infrastructure to stay competitive in an increasingly tough global economy. Exports constitute 20 percent of U.S. manufacturing production, and have increased at a rapid rate in recent years. In fact, U.S. manufactured goods exports more than quadrupled since 1990, growing twice as fast as U.S. GDP since 2002. Unfortunately, the United States is still falling behind. U.S.-manufactured goods exports fell 6.1 percent in 2015 – a trend that has continued so far in 2016. Indeed, the U.S. exports far less of its manufacturing output than the global average. Expanding ports and related infrastructure will allow manufacturers to meet global demands for our products while growing our economy and creating jobs. Especially in a region like the Pacific Northwest where one in four jobs is related to trade, MBTL is the kind of export infrastructure project that will help increase family-wage jobs for the local community.

Moreover, the Draft EIS determined any number of additional positive benefits for the region, without adverse impact. Both MBTL construction and the proposed rail improvement

would further the future economic growth for Longview. See Draft EIS 3.2.19-20, SEPA Rail Technical Report 3-9. In the course of construction and operation, any coal dust from the exports would be able to be controlled, that EPA projected standards would be met, traffic for the region would not be adversely affected, and that the project would have no "unavoidable and significant adverse environmental impacts." *Id*. at 5.7.8 and 5.7-27, Summary Chapters at page 35, Draft EIS at 3.2-25, *Id*. at 4.3.8.

However, there are a number of areas where the NAM would suggest either revision or further review before the EIS is finalized. Those areas include inconsistencies within the draft, limiting the scope of GHG emissions studied to those actually attributable to MBTL, and a revision to the mandatory nature of mitigation measures prescribed. These suggested areas are further detailed below.

<u>The Agencies Must Clarify and Eliminate Inconsistencies in the Draft EIS</u>

A primary purpose of SEPA and NEPA is to promote informed and transparent decision-making. To do this, it is imperative that EISs and other SEPA documents are clear and free from internal inconsistencies that could confuse rather than inform both decision makers and the public. There are several such inconsistencies in the Draft EIS, and the NAM urges the Agencies to eliminate these inconsistencies and make the necessary revisions to the text.

For example, Section 5.8.2.8 of the Draft EIS states that "[t]here would be no unavoidable or significant adverse impacts" from the Proposed Action. *Id.* at 5.8-33. In contrast, after calculating the projected GHG emissions attributable to the Proposed Action in the Agencies' models, the Draft EIS states that "emissions attributable to operations of the Proposed Action under the 2015 Energy Policy Scenario are considered adverse and significant." *Id.* at 5.8-16-17. These two statements cannot be reconciled and the Agencies must revise their conclusions in the Final EIS.

Likewise, Section 5.8.2.7 of the Draft EIS states that "[p]otential climate change impacts on the Proposed Action in the project area are not considered significant and would not necessitate mitigation" *Id.* at 5.8-33. In contrast, in the section describing potential mitigation measures, the Draft EIS states that "[t]he Applicant *will implement* the following measures to mitigate greenhouse gas emissions." *Id.* at 5.8.21. The Draft EIS also states that the Applicant "will prepare" and obtain approval of a greenhouse gas mitigation plan. *Id.* at 5.8.22. Again, these statements cannot be reconciled with the Agencies' conclusion that mitigation is not necessary. The Agencies must harmonize their intended treatment of mitigation measures for the Proposed Action.

<u>The EIS Must Be Limited to GHG Emissions Attributable to the Proposed Action</u>

In the Draft EIS, the Agencies conduct what is essentially a life cycle analysis of GHG emissions associated with MBTL to include all GHG emissions from facility construction and operation, as well as emissions from the transport and ultimate combustion of coal. As the NAM explained in comments on the scoping document, evaluating all GHG emissions identified in a life cycle analysis is inconsistent with both NEPA and SEPA and would dramatically overstate the actual impact of MBTL.

Further, this expanded analysis creates a very dangerous precedent that could be used to block exports. Not only do virtually all manufactured products have an environmental footprint, but the decision to make the port operator account for the footprint of those goods as a

condition to building the port is a dangerous policy manufacturers fear could restrict exports. It could also become a template for other states, and could be easily applied to other goods. Port operators should not be forced to mitigate for the life cycle environmental impact of the goods passing through their terminals, whether those goods are grains, fruits, semiconductors, automobiles, energy or anything else.

The fundamental purpose of an EIS is to inform agency decision making on the issue pending before that decision maker. To do so effectively, it is critical that agencies do not add to the decision-making criteria environmental impacts that are either so far removed from the project, or so speculative that they are not relevant to the discrete project and decision before the agency. Applying appropriate boundaries not only promotes informed agency decision making by ensuring that decisions are based on environmental impacts over which the federal agency has control, but also protect agencies and private entities whose permit or license applications are subject to NEPA and SEPA review against unnecessary litigation over hypothetical, tangential, or *de minimis* environmental effects. These limits should be strictly applied in the unique context of GHG emissions and climate change where, unlike other environmental impacts, GHG emissions are universally mixed in the atmosphere and bear no specific geographic nexus to the climate impacts they may cause.

The federal standard for reasonably foreseeable environmental impacts under NEPA must be followed if the NEPA process is to retain integrity and meaning. That same standard is also informative with respect to the scope of impacts considered under SEPA. For example, courts have held that indirect effects must only be considered when there is a "reasonably close causal relationship" that would qualify as a "proximate cause" under tort law. *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774 (1983); *see also Public Citizen*, 541 U.S. at 767 (citing W. Keeton, *et al*., Prosser and Keeton on Law of Torts 264, 274-75 (1983) for proximate cause standard). Thus, for example, under NEPA an agency need not consider environmental effects of actions over which the agency has no control. *Public Citizen*, 541 U.S. at 770 ("We hold that where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect."); *National Association of Home Builders v. Defenders of Wildlife*, 551 U.S. 644, 667 (2007) (same). Indeed, agency decision-making that rests on factors outside an agency's substantive authority would be deemed arbitrary and capricious.

Application of this proximate cause standard for indirect effects has significant implications for consideration of upstream and downstream GHG emissions for projects such as MBTL. Specifically, under NEPA a federal action cannot be considered a proximate cause of an upstream or downstream impact if such upstream or downstream impact is likely to occur even without the proposed action. Courts have frequently addressed this issue in the context of induced growth, finding that an agency need not consider the environmental effects of third party development when the federal project is responding to development that would occur anyway. *See, e.g.*, *Citizens for Smart Growth v. Dep't of Transp.*, 669 F.3d 1203, 1205 (11th Cir. 2012) (no need to evaluate "the project's stimulation of commercial interests in a previously residential area" when "commercial uses in the study area were already being planned or developed"); *City of Carmel-By-The-Sea v. Dep't of Transp.*, 123 F.3d 1142, 1162 (9th Cir. 1997) ("The construction of Hatton Canyon freeway will not spur on any unintended or, more importantly, unaccounted for, development because local officials have already planned for the future use of the land, under the assumption that the Hatton Canyon Freeway would be completed."); *Morongo Band of Mission Indians v. Fed. Aviation Administration*, 161 F.3d 569 (9th Cir. 1998) ("[T]he project was implemented in order to deal with existing problems; the fact

that it might also facilitate further growth is insufficient to constitute a growth-inducing impact under 40 C.F.R. § 1508(b).”).

The same analysis applies to upstream effects. For example, in *Sierra Club v. Clinton*, 746 F. Supp. 2d 1025, 1045 (D. Minn. 2010), the court held that environmental effects associated with oil production in Canada need not be considered when evaluating a pipeline project because the oil would be produced and transported regardless of whether the pipeline project would be completed. Thus, a proposed federal action cannot be considered a proximate cause of upstream and downstream action simply because it is part of the same chain of events.

This has important implications for the life cycle analysis of GHG emission included in the draft EIS. For example, the life cycle analysis includes emissions associated with the transportation and combustion of coal. *See* Draft EIS at 5.8-5, 5.8-14. However, if the Millennium Terminal will not induce additional coal transport or coal combustion, the GHG emissions associated with those activities need not be included when evaluating the potential impacts of the project. Thus, if the coal transported to the terminal would be mined and sold for export through other means if the project were not completed, then the project is responding to existing demand for coal exports and not inducing more use. Likewise, if U.S coal exported from MBTL merely displaces coal from other locations, it is not inducing additional combustion of coal for electricity. Under either of these circumstances emissions associated with those activities cannot be attributed to the terminal and should be excluded from the EIS.

In the Draft EIS, the Agencies appropriately recognize that GHG emission need not be included in the EIS simply because they are associated with the life cycle of the coal that would be transported through the terminal. *See* Draft EIS at 5.8-22 (“However, not all of the emissions are attributable to MBTL because some of the coal being shipped from the coal export terminal could displace coal shipped from other areas and change transportation.”). In fact, the Draft EIS concludes that virtually all of the coal exported from the terminal would displace other sources. Applying the reasoning in *Sierra Club v. Clinton*, 746 F. Supp. 2d at 1045, NAM urges the Agencies to take the same approach in determining whether GHG emissions associated with the transport of coal should be included when evaluating the potential impacts of the terminal. By excluding GHG emissions that cannot be fairly attributed to the project, the Agencies will be better able to make an informed and transparent decision based on the analysis contained in the final EIS.

From the time of its initial application, agencies have been pressured to widen the scope of NEPA analyses to include all manner of issues and potential impacts that are outside the scope of the proposed major federal action to be addressed in the EIS. Repeatedly, the courts have rejected demands to so broaden the Act’s scope. *See, e.g., Kleppe v. Sierra Club*, 427 U.S. 390 (1976); *Weinberger v. Catholic Action of Hawaii*, 454 U.S. 139 (1981). Moreover, the Washington Court of Appeals has ruled that SEPA’s requirements are “inapplicable” and only NEPA’s requirements apply to a joint NEPA/SEPA EIS; therefore, an expanded review by the Agencies for MBTL should not have applied. The Agencies must resist such pressure here and avoid an inappropriate expansion of the GHG emissions attributable to MBTL.

<u>The Agencies Should Not Impose Mandatory Mitigation Measures for GHG Emissions as Part of the SEPA Process</u>

Despite stating that “[p]otential climate change impacts on the Proposed Action … would not necessitate mitigation,” Draft EIS at 5.8-33, the Draft EIS appears to include a number of

mandatory mitigation requirements. *Id.* at 5.8-21-22. Among other things, the Draft EIS suggests that MBTL must prepare and obtain approval of a "greenhouse gas mitigation plan that mitigates for 50 percent of the greenhouse gas emissions identified in the 2015 Energy Policy Scenario." *Id.* at 5.8-22. Imposing mandatory mitigation requirements is neither required by law nor consistent with SEPA's primary purpose of informing agency decision-making. Moreover, imposing a mitigation requirement based on life cycle GHG emissions could have a significant and detrimental precedent on future projects in the State of Washington.

The NAM does not dispute that the identification and evaluation of mitigation measures is an important part of the SEPA process. In fact, the SEPA implementing regulations direct agencies to "identify, evaluate, and require or implement, where required by the act and these rules, reasonable alternatives that would mitigate adverse effects of proposed actions on the environment." WAC 197-11-030(2)(g). Likewise, the regulations state that an EIS must "[c]learly indicate those migration measures (not described in the previous section as part of the proposal or alternatives), if any, that could be implemented or might be required, as well as those, if any, that agencies or applicants are committed to implement. *Id.* 197-11-440(6)(c)(iii). However, under most circumstances, an applicant is not required to implement the mitigation measures identified in an EIS. In this respects, an EIS is fundamentally different from a Mitigated DNS, where mandatory mitigation measures are imposed as part of the SEPA process to ensure that a proposed action will not have significant environmental impacts.

Here, the Agencies have already concluded that an EIS is necessary, but appear to impose a series of mandatory mitigation measures as part of the approval process. Such mandatory requirements are not necessary here. In particular, the Agencies should not require the terminal to mitigate 50 percent of the GHG emissions identified in the 2015 Energy Policy Scenario. *See* Draft EIS at 5.8-22. While Washington requires mitigation of GHG emissions under some circumstances, *see* RCW 80.70 and RCW 80.80, the Agencies concede "[t]he mitigation requirements in RCW 80.70 and RCW 80.80 are not directly applicable to the Proposed Action." Draft EIS at 5.8-21. Under these circumstances, there is no basis for the Agencies to require mitigation of GHG emissions from the Proposed Action, let alone mandatory mitigation at the upper end of what these inapplicable regulations require of other sources. Requiring mitigation of GHG emissions in this SEPA review would impose substantial burdens on the Millennium Terminal and would also have the potential to create precedent that would discourage future investments in the state. For these reasons, the Agencies should clarify in the final EIS that all GHG mitigation measures should remain voluntary.

Conclusion

As manufacturers we rely on terminals like MBTL to export our goods, products and raw materials to customers around the world. United States coal exports are supported by jobs in the manufacturing industry. These jobs include mining and support activities for coal mining; construction; railroad transportation; transport by water and truck; port operations and cargo handling; and all the manufacturing supply chain jobs that support these activities. Manufacturers support investments in private infrastructure projects that improve the nation's transportation and export capacity while also meeting established environmental standards. Through a thorough SEPA process, MBTL has shown that the project will be able to promote economic gains for the community and industry, create jobs, and maintain environmental harmony. The NAM offers that a final EIS would benefit from clarifications to three items detailed: inconsistencies within the document, limiting to those GHG emissions which are actually attributable to MBTL, and that mitigation measures proposed under SEPA are voluntary

for the project. Manufacturers appreciate the opportunity to comment on the Draft EIS, and hope the Agencies will approve such a worthy project as MBTL soon.

Sincerely,

Ross Eisenberg
Vice President
Energy and Resources Policy

Submission Number: ***MBTL-SEPA-DEIS-0003329***

Received: 6/13/2016 8:55:26 PM
Commenter: Brenda Lindlief-Hall
Organization: National Wildlife Federation
State: Montana

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

On behalf of the National Wildlife Federation, thank you for this opportunity to comment on the April 29, 2016 Millennium Bulk Terminal draft environmental impact statement. We hereby voice opposition to the proposed Millennium Bulk Terminal (MBT) coal export facility and ask that the co-lead agencies, Cowlitz County and the Washington State Department of Ecology that prepared the draft environmental impact statement (EIS) choose the No Action Alternative. The proposed Millennium Bulk Terminal (MBT) coal export facility would lead to unprecedented rail traffic across Wyoming, Montana, Idaho and Washington. Approximately sixteen uncovered coal trains would cut through critical wildlife habitat and pass through scenic rail corridors and parallel sensitive waterways. Despite the unprecedented, wide-ranging impacts of MBT, the EIS fails to fully address the cumulative impacts. The impacts of the proposed MBT are not confined to the Longview port, but extend from the mines in the Powder River Basin, along the full length of the rail lines to the port at Longview, across the Pacific Ocean, and beyond to Asia where the coal would ultimately be burned. But the impacts do not stop there. The impacts of green house gases from burning coal overseas come full circle back to pollute our air and our wildlife and aquatic life habitat, and create ever-increasing climate change threats. Despite these well-known cumulative impacts, the EIS addresses only the immediate impacts of MBT. Coal mining occurs on some of the most fragile lands and most important wildlife habitat in the Powder River Basin. Both direct and indirect mining impacts, from strip mining and blasting to sedimentation and pollution of waterways, threaten aquatic and wildlife habitat. In addition, the failure to fully reclaim the land after mining, or to reclaim to substandard conditions, is well documented and leaves the land unable to sustain healthy wildlife populations. Coal trains leave hundreds of pounds of fugitive coal dust in their wake en route from the mines in the Powder River Basin to the ports on the west coast, fouling our waters and threatening our already stressed aquatic life, fisheries and fishing and sporting economies across the northwest. Fugitive coal dust not only contains particulates that pollute the air, but deposits mercury, lead, arsenic and other neurotoxins and carcinogens into the air, land and water. Coal dust smothers and reduces oxygen in waterways that is essential to healthy aquatic life populations, and those devastating impacts cascade up the food chain. In addition to the on-the-ground impacts, burning fossil fuels and the attendant greenhouse gas emissions likewise threaten our fish and wildlife and way of life due to climate change. Pollution and climate impacts from burning coal knows no boundaries, and poses unacceptable, potentially catastrophic, risks to wildlife and aquatic life. It is our understanding that Washington statutes and regulations provide the co-lead agencies with the authority to deny a project if such denial is based on an appropriate policy; if the agencies find that the project would result in significant adverse impacts; and if the adverse impacts of the project cannot be mitigated through reasonable mitigation measures. We do not think there are any mitigation measures available to remedy the adverse impacts that would unfold should MBT permit be granted. It is our position that Cowlitz County and the Washington State Department of Ecology have more than ample authority to deny the MBT permit. We ask that you say no to this disastrous proposal and choose the no action alternative.

Submission Number: ***TRANS-SPOKANE-M2-00009***

Received: 5/26/2016 12:00:00 AM
Commenter: Brenda Lindenhall
Organization: National Wildlife Federation
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good afternoon. My name is Brenda Lindenhall. I'm here on behalf of National Wildlife Federation to voice opposition to the proposed Millennium Bulk Terminal coal export facility.

I'm also here to express concerns about inadequacies in the EIS. All impacts from the lines to the coal-fired power plant emissions overseas must be addressed.

Coal mining occurs on some of the most fragile lands in the Western United States and threatens wildlife, waters, and aquatic life. Those impacts must be addressed.

Coal trains lose hundreds of pounds of coal dust en route to the Pacific coast, despite the use of surfactants. That is coal dust ends up in the waters, along the rail lines, and threatens our already stresses aquatic life and fishing, sporting, and tourism economies from the Powder River Basin to Longview and the Pacific.

The fishing economies are probably in the billions. I know Washington state is billions of dollars.

The impacts to these facilities are not confined to Longview or Washington, however, but extend from the mines in the Powder River Basin to the Pacific coast and beyond.

Burning fossil fuels is threatening our fish and wildlife and our way of life due to the climate change impacts. Pollution and climate change know no boundaries. All of the social costs occur unless we take them into account.

Permitting a coal export facility with such disastrous consequences makes no sense. I urge you to please choose the no action alternative for present generations and those to come. Thank you.

new progressive alliance

NewProgs.org

June 3, 2016

The New Progressive Alliance at http://newprogs.org/ urges that the "no action" course mentioned by the Draft Environmental Impact Statement (DEIS) be followed in the proposed Millennium Bulk Terminals. References are at the end of this comment.

1. **This is a Bad Business Plan**

S6 of the DEIS says Millennium will be good for the local economy because it will cause increased jobs and increased taxes. This is based on false assumptions.

Only someone with little or no knowledge of jobs could think that exporting fossil fuels from Longview will ever help us with jobs or a tax base. To begin with, companies relocate to pleasant rather than polluted environments. Secondly, there are more jobs in renewable energy than in the fossil fuel industry, a trend that is only increasing.

The coal industry is dying thanks to natural gas, environmental regulation and shrinking global demand. A string of coal companies have filed for bankruptcies in recent months, including Peabody Energy, the world's largest coal company and Arch Coal, the world's second largest coal company and former Millennium partner. Over 26 companies have filed for Chapter 11 bankruptcy in the past two years leaving workers and retirees penniless. Faced with collapsing price of thermal coal and export markets caused by slumping demand and too much supply, Wall Street has no appetite to finance new infrastructure. Arch Coal, which is restructuring itself after filing for bankruptcy, saw Millennium as a financial drain rather than cash-making investment and pulled out.

The Obama administration announced Friday April 8, 2016 that it will halt issuing new coal leases on federal lands as the administration weighs a programmatic overhaul.

"The bringing in of low-production-cost natural gas into the North American energy space has been absolutely game-changing for coal," said James Stevenson, director of North American coal at IHS Energy. "I rank that bigger than regulatory impact."

Even worse, the strong U.S. dollar is driving buyers to other countries. Russia's ruble fell about 20 percent last year, and the Australian dollar some 10 percent, according to Capital Economics.

"These falls have shielded Russian and Australian exporters from the full impact of weakening demand for coal," analysts Oliver Jones and Tom Pugh wrote last month.

In February, a report from a global research firm Wood Mackenzie, concluded that weak demand and plummeting prices made any new coal docks in the Northwest economically unviable. That same month, Cloud Peak Energy's accountants wrote off its rights to access Millennium's docks as essentially worthless.

The principals of this proposed Millenium deal while at TransMessis fired all workers without warning and are presently defending a lawsuit saying they lied on credit applications while owing 1.6 million dollars in outstanding debts. Waterside Energy LLC has also held secret meetings for over a year with the Port of Longview trying to hide this from the public eye. With Arch gone, Millennium no longer has a backer with a balance sheet to finance a major infrastructure expansion

*R*ecall how Millenium deceived us about the volume of coal they wanted to ship through our community. It is also worth noting Arch Coal increased CEO and executive pay so much that the SEC noticed. Their CEO pay went from 3.9 million to 4.3 million in 2013 and to 7.3 million in 2014. Why increased pay for a failing company?

The Port of Vancouver's Operation Manager, Mike Schiller wrote: "Coal is the most risky bulk mineral market. Consuming markets have no loyalty and will quickly shift to the cheapest market. Prices and markets can change before a facility is completed. . . . Because this is a fickle market, there is real danger in losing investment – both in construction capital and lost opportunity in a poorly performing asset (i.e. a single commodity terminal handling lower than expected volumes)."

Coal export requires a small workforce and wastes hundreds of acres of waterfront property to store raw coal. Millennium displaced 50 employees when it bought the waterfront property and they plan to produce just 20 additional jobs. It's not worth the risk. The proposed 460-acre coal export site has tremendous potential for thousands of jobs in light industrial and smart-tech growth, instead of being mired in a single commodity dirty export trade.

In addition to woes in the United States, export prospects look very poor. DEIS was wrong to just blindly take Millennium's numbers without further investigation.

Asians are just not investing heavily in coal plants. China – the proposed buyer of the coal and by far the world's largest coal consumer – faces a huge oversupply causing a suspension of any new coal mines. Because of this China raised up its domestic supply last year, throwing into question how much it will ultimately buy from America. Chinese coal imports in 2015 were almost a third lower than they were in 2014, according to Capital Economics. China has been trying to reform its domestic coal producers so it can be more self-reliant, said Stevenson of IHS. In Paris, the climate talks were bolstered by a joint agreement between the United States and China to cut greenhouse gases. China has said it will transition the economy from a manufacturing-led one to a consumer-led one which necessarily means less reliance on coal.

Coal companies have a long history of leaving behind retirement pay, jobs, and devastated landscapes after fleeing with obscene profits. See references at the end of this paper for documentation.

2. Millennium will be Disastrous for Health

S6 of the DEIS says "The analysis determined the estimated maximum concentrations for each criteria air pollutant would be below the National Ambient Air Quality Standards established by the U.S. Environmental Protection Agency."

The DEIS has ignored the testimony of expert medical professionals and said perhaps a health report will come later. This is a fatal mistake. National Ambient Air Quality Standards established by the U.S. Environmental Protection Agency are completely irrelevant. The question is Millennium's effect on health.

There is no such thing as "clean coal." Smog forming nitrogen oxides, toxic heavy metals, mercury, polyaromatic hydrocarbons, sulfur, lead, arsenic, cyanide, and soot forming sulfur dioxide make coal the dirtiest power by far. The pollution in both the transportation and the burning come with a predictable result. Medical professionals have attributed an increase in asthma attacks, heat-related deaths, emphysema, respiratory complications, chronic bronchitis, heart attacks, and premature death from heart and lung disease to the coal transportation being proposed. Children and senior citizens are especially vulnerable.

These adverse health effects also have a disproportionate impact on vulnerable communities such as the poor and working class neighborhood of the Highlands of Longview. This affects the lives of the folks who not only live on the wrong side of the tracks, but all along the tracks. Our area already is significantly worse off in terms of these health issues than most of the rest of the state.

The University of Washington reported coal trains emit nearly double the amount of pollution compared to freight trains. Consideration needs to be given to the extra diesel exhaust which causes deleterious effects to health.

Burlington Northern Santa Fe (BNSF) acknowledges that coal trains spill a lot of dust. BNSF's studies show that 500 pounds of coal can be lost in the form of dust from each rail car. Each 100-car train, therefore, may spill 50,000 pounds of coal dust into our rivers and towns. BNSF's website stated that "the amount of dust that escapes from PRB [Powder River Basin] trains is surprisingly large." BNSF has removed this page from its website, but our allies at the Sightline Institute captured the image.

Coal dust blowing from the coal terminal will foul the air and water, as well as homes, boats, and businesses up to several miles away. The Westshore coal terminal in British Columbia is located three miles from residences, yet homes are still covered with coal dust.

S6 This Draft EIS uses this New Zealand study to identify a threshold for nuisance level dust deposition. Coal dust nuisance impacts refer to coal dust that affects the aesthetics, look, or cleanliness of surfaces but not the health of humans and the environment." This is not only without proof, it is palpable nonsense! Science clearly comes down on verifying coal dust is toxic and not a mere legal nuisance as verified by the references at the end of this paper.

3. <u>Rail Traffic will slow Traffic and Emergency Vehicles</u>

S6 of the DEIS says, "Proposed Action…related rail traffic would not affect land use because existing land uses currently coexist with rail traffic." This misses the larger point. Sixteen trains each having a length of over one mile means of necessity traffic will be significantly delayed. More critical are emergency vehicles that will be delayed likely resulting in loss of property and lives.

4. <u>Greenhouse Gas Emissions</u>

S.7.9 of the DEIS says, "Implementation of the Proposed Action would result in increased greenhouse gas pollution." This is certainly true. Coal also produces more greenhouse gases than any other form of energy and 44 million tons of coal a year is a lot. Raising carbon dioxide levels in any country raises it worldwide. The immediate effect of exporting coal to Asian nations encourages them to burn more dirty coal and prolongs the world's transition to cleaner alternatives. The result would be more global warming pollution resulting in more forest fires, more flooding and lost agriculture, more violent storms, more droughts, and greater loss of forestry and fishery revenues, and greater numbers of climate refugees. Unfortunately all these ill effects have already started.

This will hurt United States interests because of the 2015 United Nations Agreement COP21. Even if COP 21 is not adopted by the United States, the increased carbon output from coal for the United States will be reported and compared with other countries. This will surely put us in a poorer position with other countries when it is time for continued negotiations.

"If you make peaceful revolution impossible you make violent revolution inevitable."

John F. Kennedy

If the State of Washington chooses to go against both the majority of people and the overwhelming preponderance of evidence to build the largest coal terminal in North America then it will face more than the displeased people of Longview. We will rightly be the focal point for environmental action for this continent and perhaps even worldwide at the loss of our reputation as a state formerly known for protecting its environment.

Conclusion

A proposal to export 44 million metric tons of coal annually from a site on the Columbia River, Millennium Bulk Terminals would be the biggest coal terminal in North America. So far the government agencies reviewing the project were swamped with 215,000 public comments during the "scoping" phase of the review. This is the last major fossil fuel project remaining – all the others have been turned down. Let us not make a bad decision that we will be stuck with for half a century or more.

Coal companies are not responsible for these health effects or for clean up when coal ash spills and destroys water supplies. Unlike students who can't declare bankruptcy if there are no jobs after student loans, companies have the cost to clean up the environment and health costs paid for by taxpayers. Property damage, lost lives, environmental damage, and health costs are never paid for with cities and towns picking up the tab while companies keep the profits. Washington should not fall for this Millennium scam that will cost both jobs and money.

S-7 says despite S6 mitigation measures, "Unavoidable and significant adverse environmental impacts could remain for nine environmental resource areas: social and community resources; cultural resources; tribal resources; rail transportation; rail safety; vehicle transportation; vessel transportation; noise and vibration; and greenhouse gas emissions."

Given the above, the no action course is the best one to follow.

References:

See references 52, 82, 97, 98, 101, 133, 159, 174, 207, 308, 421, 498, 814, 830, 906, 1024 - 1036, 1156, 1214, 1216, 1292 - 1312, 1422, 1525-1532, 1666, 1708, 1709, 1722-1725, 1897-1905, 1960, 1963, 2016, 2038 2052, 2091-2103, 2224-2226, 2261, 2287, 2308, 2382-2397, 2540-2550, 2627, 2628, 2703-2738, 2742, 2767, 2845, 2873-2880 of the article located here: http://www.newprogs.org/the_environment_under_the_democratic_republican_uniparty

Sincerely,

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NORTHERN PLAINS
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June 10, 2016

RE: Comments on Millennium Bulk Terminals draft environmental impact statement

Dear Ms. Placido and Ms. Torteff:

On behalf of the members of Northern Plains Resource Council (Northern Plains) and the Western Organization of Resource Councils (WORC), we are submitting the following comments to the Washington Department of Ecology and Cowlitz County in response to the April 29, 2016, draft environmental impact statement (DEIS) on the application from Millennium Bulk Terminals – Longview, LLC (MBTL) to construct and operate a coal export terminal. Please ensure that our comments are entered into the public record.

Northern Plains is a grassroots conservation and family agriculture non-profit organization based in Billings, Montana. Northern Plains organizes Montana citizens to protect our water quality, family farms and ranches, and unique quality of life. Northern Plains is dedicated to providing the information and tools necessary to give citizens an effective voice in decisions that affect their lives. These comments are also submitted on behalf of the Western Organization of Resource Councils (WORC), a regional network of eight grassroots community organizations that includes 12,200 members and 40 local chapters in seven states; Northern Plains is a member of WORC. WORC is committed to building sustainable environmental and economic communities that balance economic growth with the health of people and stewardship of their land, water, and air resources.

Northern Plains formed in 1972 over the issue of coal strip mining and its impacts on private surface owners who own the land over federal and state mineral reserves as well as the environmental and social impacts of mining and transporting coal. Many of our members own farms and ranches in areas that are strip mined for coal. Our members' livelihoods depend

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entirely on clean air and water, native soils and vegetation, and lands that remain intact. Many more of our members live along and near railroad lines that would be the conduit for the millions of tons of coal proposed for shipment to the Longview, Washington, coal export facility.

The MBTL applicant's financial backers continue to shift, bringing into question the stability of the applicant and its long-term ability to build, maintain, and manage the consequences of the project. When the DEIS for the terminal was released on April 29, 2016, the project was owned jointly by Arch Coal and Lighthouse Resources, both of which were facing questionable financial situations at the time. Since that time, Arch Coal has sold its share of MBTL to Lighthouse.

However, based on the recent management decisions of these two companies as well as recent statements made by them concerning the coal export market, one has ample reason to believe that the applicant may not be able meet all of the fiscal obligations this project would entail, if permitted. For example:

- Arch Coal, which until very recently owned 38% of MBTL, filed for bankruptcy on January 11, 2016. Arch Coal is currently in Chapter 11 bankruptcy proceedings. In a filing[1] from that proceeding, Arch Coal has sought to reject an existing contract for coal loading and unloading with Ridley Terminals, Inc. in British Columbia. Under that contract, Arch Coal is obligated to pay annual shortfall fees if shipments fall below a certain minimum amount. In the bankruptcy filing papers, Arch Coal stated " . . . given the continued weakness in demand for international seaborne coal, the shortfall fees in future periods would continue to be substantial."[2]
- The owner of the other 62% of the project was, originally, Ambre Energy North America. In order to avoid its own bankruptcy, Ambre Energy North America was purchased by Resource Capital Funds (RCF), a Cayman Islands hedge fund. RCF obtained a controlling interest in the company in November 2014 and rebranded it Lighthouse Resources. In the notice and explanatory statements for the directors and general shareholders meeting concerning the 2014 sale, Ambre Energy cited "what industry analyst firm Wood Mackenzie has described as a substantial oversupply of thermal coal in the seaborne market. . . ."[3]

Numerous professional economic analyses and projections point to a continuing decline in coal production and the use of coal as an energy source as well as weak coal export markets (see below for details). The financial and market analysis presented in the MBTL DEIS does not adequately examine the fiscal viability of the applicant or the strength of the Asian export market that the terminal is planned to serve.

Arch Coal is not the only existing Powder River Basin (PRB) coal mining company attempting to terminate its existing export contracts in British Columbia. Both Signal Peak

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[1] United State Bankruptcy Court Eastern District of Missouri Eastern Division. Chapter 11. Case No. 16-40120. Doc 28. Files January 11, 2016.
[2] *Ibid 3.*
[3] "What Ambre Energy Says About Its Financial Collapse." Clark Williams-Derry, Sightline Insitute. December 3, 2014. http://www.sightline.org/2014/12/03/what-ambre-says-about-its-financial-collapse/

Energy and Cloud Peak Energy have, within the past 12 months, renegotiated shipping contracts with the Westshore Terminal in British Columbia. In these contract negotiations, the coal mining companies are paying penalties to the terminal in order to discontinue export of coal for, at a minimum, the next three years.

If permitted and constructed, the MBTL facility would increase rail traffic that would have significant and deleterious consequences for Montanans. However, the analysis presented in the MBTL DEIS does *not* include the connected and cumulative impacts that this project would have on Montana (see below for details) communities crossed by the rail line. The DEIS does not entirely ignore Montana rail impacts, but it does not analyze the rail impacts to Montana. Instead, the DEIS makes vague, generalized references to Montana rail impacts, while very specifically and thoroughly analyzing rail impacts on specific segments of rail line in Washington.[4] The DEIS completely ignores one Montana rail route that is currently used for coal transport: the Hi-Line, which is in northern Montana near the Canadian border and passes south of Glacier National Park on its path to Idaho and the West Coast. All of the coal trains that would haul coal to the MBTL project, as well as all of the empty coal trains on the daily return journey, would originate in the PRB of Wyoming and Montana. It is clear from the DEIS's analysis of rail impacts in Washington that the agency could evaluate and make a clear, thorough, and sophisticated study of rail impacts in Montana, but it does not. The environmental analysis must include such a study. The study area for rail transportation impacts in the MBTL DEIS is too narrow and completely ignores impacts to Montana and Montanans.

If permitted and constructed, the MBTL facility would result in increased coal strip mining in Montana with significant and deleterious consequences for the land, air, water, wildlife, and people in those areas. However, the analysis presented in the MBTL DEIS does *not* include the connected and cumulative impacts this project would have on Montana (see below for details).

Coal is the world's most carbon-intensive fuel. The burning of coal has global impacts because of carbon emissions. It does not matter where coal is burned, the pollution found in the emissions ride the global air currents to every part of our earth. If permitted and constructed, the MBTL facility would ultimately result in more coal being burned, which would release more greenhouse gases (GHG) into the atmosphere. These GHG are causing global climate change, which is already affecting Montana. The analysis presented in the MBTL DEIS does *not* include the connected and cumulative impacts this project would have on Montana (see below for details).

For all of these reasons, we believe that the MBTL DEIS does not fully disclose or analyze the issues, costs, consequences, or connected and cumulative impacts of permitting and building the proposed export facility. By ignoring the connected and cumulative impacts to Montana and Montanans, this DEIS does not clearly and concisely convey to the public and to government officials the environmental impacts of the proposed project. Thus, the MBTL DEIS fails to provide the public and agency decision makers with sufficient information to make an informed decision. We urge the decision makers of the Washington State Department of Ecology

[4] See Table 5.0-4. Summary of Direct Impacts and Indirect Impacts Study Areas by Resource. Millennium Bulk Terminals—Longview Draft SEPA Environmental Impact Statement. Chapter 5. pp. 5.0-4.

and Cowlitz County to choose the "no-action" alternative and to deny issuance of any permits necessary for construction and operation of the Millennium Bulk Terminal – Longview.

Coal Economics, Coal Markets, and the Future of Coal Exports

According to the DEIS, "the Applicant states the Proposed Action would enable western U.S. coal to compete in the Pacific international coal supply market by providing a facility designed to efficiently transport western U.S. coal from rail to ocean-going vessels. The Applicant states further development of western U.S. coalfields and the growth of Asian market demand for U.S. coal is expected to continue, and existing West Coast terminals are unavailable to support this need. According to the Applicant, to derive benefit from economies of scale, implementation of the Proposed Action would provide a coal export terminal sufficient in throughput to give U.S. coal producers the opportunity to expand their share of the international coal market."

Much of the coal that U.S. producers intend to export in order to expand their share of the international coal market has been leased from the U.S. Government via the Bureau of Land Management's (BLM) federal coal leasing program. Recently, that program has come under fire from taxpayer advocates, environmental non-profits, and the federal government itself. Both the Government Accountability Office (GAO) and the Department of the Interior's Office of Inspector General (OIG) released scathing critiques of the BLM's federal coal leasing program in 2013. These reports prompted Interior Secretary Sally Jewell to initiate a review of the federal coal leasing program in January 2016 through a Programmatic Environmental Impact Statement (PEIS). The PEIS will review and make appropriate changes to the entire federal coal leasing program. In the Secretarial Order that initiated the PEIS, Secretary Jewell writes that the PEIS must specifically consider the export of federal coal: "The PEIS should address whether leasing decisions should consider whether the coal to be produced from a given tract would be for domestic use or export."[5]

The primary area where coal to be mined for the market for the proposed terminal is the PRB, where approximately 80% of coal produced is from a federal lease. Yet the MBTL DEIS does not consider the PEIS and its review of the role of export in the federal coal leasing program. Outcomes of the PEIS may create significantly different alternative scenarios for filling export capacity at the proposed terminal. These outcomes should be considered in the MBTL DEIS.

While coal companies want to believe that coal markets will improve, that appears highly unlikely for both domestic and export markets.[6] This negative outlook for the coal industry is shared by the world's leading investment banks and coal consultants. Since 2013 major U.S. financial institutions from Goldman Sachs[7] to Bank of America[8] as well as the World Bank have been pulling back from and entirely divesting from coal. Additionally, non-profits such as the Rockefeller Brothers Fund and public institutions like Stanford University have also removed

[5] Secretary of the Interior. Secretarial Order No. 3338. January 15, 2016.
[6] http://www.bloomberg.com/news/articles/2015-07-13/the-latest-sign-that-coal-is-getting-killed
[7] http://thinkprogress.org/wp-content/uploads/2013/08/GS_Rocks__Ores_-_Thermal_Coal_July_2013.pdf
[8] http://about.bankofamerica.com/assets/pdf/COAL_POLICY.pdf

coal from their portfolios, as has the Norwegian government's pension fund.[9] Other financial institutions and analysts, including Deutsche Bank[10], Sanford Bernstein & Co.,[11] Morningstar,[12] Goldman Sachs,[13] and others, are predicting that the coal market bubble has burst and production numbers and prices will remain low and even decline for many years to come.

It is particularly notable that Goldman Sachs went from being a significant investor in the proposed Gateway Pacific Terminal coal export facility near Bellingham, Washington, to divesting all of its shares in that project in January 2014.[14] The investment company later stated that "we believe that new investment in large-scale projects requiring new infrastructure is unlikely to earn a return; the window for profitable investment in new mining and infrastructure capacity has closed."[15] [NOTE: On May 9, 2016, the U.S. Army Corps of Engineers denied a permit for the Gateway Pacific Terminal.]

Until recent years, Western U.S. coal was produced almost entirely for domestic consumption. In 2011, as domestic coal sales were beginning to flatten for a variety of reasons (including, but not limited to industry transition to natural gas, increased energy efficiency, increased use of renewable energy sources, and increasingly difficult geologic conditions [the easily mined coal had already been extracted] for all coal producers), the PRB coal companies began to focus on the potential of the Asian coal export market. International coal sales from the PRB had grown from 3.8 million tons in 2009 to 20 million tons in 2011. The MBTL applicants (as well as other coal companies) envisioned a growing and profitable export market for their coal and proposed various coal export facilities, including MBTL. However, by 2012, the international coal export markets in Asia, especially China, were beginning to show signs of decline. While 31 million tons of coal were exported in 2014, this tonnage was below the U.S. Energy Information Administration (EIA) forecast, and EIA downgraded its 2015 and 2016 export outlook by 30% from its 2014 export outlook.[16]

Benchmark prices for thermal coal (which are based on the price of Australia's Newcastle coal) are the lowest they have been since 2007. At its peak in January 2011, the price was $141.94/ton; by mid-March 2015, the price was $59.50/ton; by December 2015 it was $43/ton. Prices are predicted to stay at or below $60/ton through 2021. This is below the profitability level that existing coal mines in the PRB have stated they need to participate in the export market (*e.g.*, in 2010/2011, both Peabody Energy and Arch Coal said they needed the price of coal to be in the $90/ton range to make it worthwhile to export coal, and, in 2014, Cloud

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[9] http://www.nytimes.com/2015/06/06/science/norway-in-push-against-climate-change-will-divest-from-coal.html
[10] "Thermal Coal: Coal at a Crossroads," Deutsche Bank Markets Research, May 2013
[11] "Asian Coal & Power: Less, Less, Less . . . The Beginning and the End of Coal," Bernstein Research, June 2013
[12] "Burned Out: China's Rebalancing Heralds the End of Coal's Growth Story," Morningstar, April 2014
[13] "The Window for Thermal Coal Investment is Closing," Goldman Sachs, July 2013, http://thinkprogress.org/wp-content/uploads/2013/08/GS_Rocks__Ores_-_Thermal_Coal_July_2013.pdf **and** "The Thermal Coal Paradox," Goldman Sachs, May 2014, http://www.eenews.net/assets/2014/05/28/document_gw_02.pdf
[14] "Wall Street Giant Backs Away From Washington Coal Export Project," Oregon Public Broadcasting, January 2014, http://opb.org/news/article/wall-street-giant-backs-away-from-washington-coal/
[15] "The Window for Thermal Coal Investment is Closing," Goldman Sachs, July 2013, http://thinkprogress.org/wp-content/uploads/2013/08/GS_Rocks__Ores_-_Thermal_Coal_July_2013.pdf
[16] Verified Statement of Thomas Sanzillo, 25 March 2015, submitted by Northern Plains to the STB as part of their petition to revoke the December 2012 TRR application.

Peak Energy said it needed the Newcastle price to be between $80 and $90/ton for it to export coal at a profit).[17]

Chinese thermal coal imports are declining dramatically (Chinese imports peaked in 2013), and its coal consumption fell 3% in 2014 despite an increase in energy demand; that trend continued in 2015 with thermal coal imports down 39.1% in January to July over the same period in 2014.[18] While China is not the only coal consumer in the Pacific Rim, that country is such a comparatively large consumer of coal that it serves as the market indicator for all Asia Pacific coal demand. Simply put, if China is purchasing large quantities of coal, then there is a large demand to fill. If China is reducing its consumption of coal, then the entire Pacific Rim coal market is likely oversupplied. At least five major Chinese coal-fired power plants have or are being shut down as that country deals with dramatic air pollution issues and industrial overproduction—issues that are significantly affecting China's gross domestic product. More than 6,000 coal mines have already been closed in China. The Chinese government has announced plans to limit its annual coal consumption to 4.2 billion tons by the end of this decade – and its current production capacity is beyond 4 billion tons so it is unlikely that coal imports will increase.[19]

While Asian countries are still importing some coal, it is closer and cheaper to import coal from Australia and Indonesia as well as either Russia or South Africa rather than from the PRB of the United States. Indonesia is the world's largest exporter of coal and Australia is second. Australia has plans to increase its port capacity. Should that happen, there would be a significant impact on market prices for coal in Pacific Rim countries. Even if that doesn't happen, there are still problems for the viability and growth in tonnage of PRB coal into the international coal market.

Even the coal industry's own analysts have boldly denounced the financial viability of proposed Pacific Northwest coal export facilities, including the MBTL. Wood MacKenzie, the premier mining industry consulting firm, recently stated on its website that Northwest coal ports are "nothing more than a risky long-term bet" because "future demand in Asia will continue growing less robustly than in the past. Negative netback PRB margins will persist. PRB coal simply will not compete in Asia until well after 2020."[20]

The global coal market is oversupplied. In Europe, coal use (both production and imports) has been declining significantly in recent years. South Korea recently imposed a significant carbon tax on imported coal, which specifically prejudices against certain grades of sub-bituminous coal found in the PRB mines that propose to fill capacity at MBTL. In fact, the tax itself (on a per metric ton basis) is larger than the cost of a metric ton of coal at the mine

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[17] *Ibid.* **and** http://www.greenpeace.org/usa/wp-content/uploads/legacy/Global/usa/planet3/PDFs/Coal%20Market%20Report%20Q1%202015.pdf

[18] http://www.businessinsider.com.au/chinese-coal-imports-are-collapsing-2015-9

[19] "Asian Coal & Power: Less, Less, Less . . . The Beginning and the End of Coal," Bernstein Research, June 2013; "Burned Out: China's Rebalancing Heralds the End of Coal's Growth Story," Morningstar, April 2014; http://www.newsweek.com/beijing-shuts-down-coal-power-plants-air-pollution-costs-economy-316829; http://www.mcclatchydc.com/2015/03/11/259356/chinas-push-to-cut-coal-use-may.html

[20] "Planned US coal ports: a swift trip from vital to irrelevant." Andy Roberts, Wood MacKenzie. February 10, 2016. http://www.woodmac.com/blog/planned-us-coal-ports-a-swift-trip-from-vital-to-irrelevant/

mouth of some PRB coal mines.[21] As explained above, China's imports of thermal coal fell dramatically from 2014 to 2015, and coal consumption at its electricity-generating power plants fell 10% in the same time period. China has a 6% coal tariff on U.S. coal, but it has no tariff on coal imported from Indonesia, which is closer to China and with which China has a free-trade agreement.

Even existing PRB exporters have ceased exports due to market conditions. Multiple Montana coal producers that were successfully exporting coal through British Columbia export terminals have renegotiated their contracts with those terminals in order to discontinue the practice. Cloud Peak Energy, a PRB coal producer, renegotiated its contract with Westshore Terminals in order to reduce their tonnage obligation to zero until 2019.[22] Signal Peak Energy, which operates a longwall mine in the Bull Mountains north of Billings, Montana, recently did the same.

While it is recognized that coal will not disappear from the energy stream immediately, market forces do indicate that coal is increasingly going to have a smaller and smaller share of the energy market, domestically as well as internationally. There is an explosion of renewable energy options for countries such as China and India. Citizens in these and other countries are demanding that pollution problems associated with burning of fossil fuels be cleaned up. Major cities in both China and India have experienced severe air pollution problems caused by the burning of fossil fuels, which has led to significant changes to those governments' energy policies and priorities. China is the world's biggest investor in renewable energy sources, spending a total of $400 billion on clean energy in the past 10 years. China has already installed more wind power than any other country in the world (it added an additional 19.8 gigawatts of wind turbines to its grid last year), and it installed more solar capacity than any other nation in 2014.[23]

As noted above, many financial institutions and investment analysts are advising that the export market for U.S. coal is oversupplied, under severe stress, and likely to remain in this condition for the foreseeable future. Chinese coal imports drive the U.S. export market. The decline in the international market for coal affects PRB coal company plans for a vibrant export market to make up for the lack of a domestic market for coal. Consequently, there is little likelihood that a major, new, multi-million dollar coal export terminal would ever pay for itself, much less bring any sort of benefit to the people of Longview or Washington State, given the realities of today's – and tomorrow's – coal markets.

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[21] "South Korea's All New Tax on Imported Coal," Clark Williams-Derry, Sightline Institute, July 2014, http://daily.sightline.org/2014/07/01/south-koreas-all-new-tax-on-coal-exports/ **and** http://carbunion.com/panel/infoprecios/uploads/MCR%20327.pdf

[22] "Fewer coal trains expected in Whatcom after Cloud Peak cuts." *The Bellingham Herald*. Matt Brown (Associated Press) and Ralph Schwartz, October 29, 2015. http://www.bellinghamherald.com/news/local/article41872647.html; and "Montana coal production down a third." Tom Lutey, *The Billings Gazette*. June 9, 2016. http://billingsgazette.com/news/government-and-politics/montana-coal-production-down-a-third/article_d3ee32da-c82e-5e31-9d3a-a3932a7c7092.html

[23] "Longyuan First-Half Profit Climbs on Stronger Wind Output." Bloomberg News. August 18, 2015. http://www.bloomberg.com/news/articles/2015-08-18/longyuan-first-half-profit-climbs-on-stronger-wind-output **and** "China's Climate Goal Calls For Aggressive Push on Solar,Wind. Bloomberg News. July 1, 2015. http://www.bloomberg.com/news/articles/2015-07-01/china-s-climate-goal-calls-for-aggressive-push-on-solar-wind

The MBTL coal export facility is, frankly and simply, a risky long-term bet. The State of Washington and Cowlitz County must consider the real possibility that if the MBTL facility is permitted and construction begins, fiscal and market conditions could lead to abandonment of the project. What assurances would the residents of the community have that the area would be cleaned up and not left as an eyesore with possible environmental liabilities to their community? The facts about the viability of coal as shown by the current and future market analyses, including the export market, must be recognized and evaluated in the environmental analysis. Given a declining (some would say, lack of) market for coal that would be processed through MBTL, there is little purpose or need for MBTL. Thus, it is our opinion that these facts provide the Washington State Department of Ecology and Cowlitz County ample reason to recommend the no-action alternative and deny approval for what we believe is a speculative project.

Increased Train Traffic in Montana Due to MBTL

While we believe, based on the evidence thoroughly presented above, that the MBTL project is speculative and is based on a seaborne coal market that will not materialize, if the State of Washington and Cowlitz County decide differently, it must be under the assumption that the Asian coal market is – or at least will become – strong. Under this assumption of a strong market that makes use of the Proposed Action, there will be a dramatic increase in coal train traffic through many communities in Montana. Any action alternative must fully assess the impacts of increased coal train traffic through Montana – from the coal mines in the PRB to the proposed MBTL port and back again.

While the DEIS examines increased train traffic *in Washington*, those trains do not simply appear at the Washington state border; they come from somewhere. In fact, those trains originate at PRB coal mines in Wyoming and Montana and traverse Montana on their way to the proposed facility as well as on the way back to the PRB. The DEIS states that there will be 16 additional trains each day traveling the rails if MBTL is approved. There would be numerous impacts to Montanans and Montana communities from this increase in the number of trains – and those impacts are not just "inconveniences." There would be health, safety, quality of life, as well as actual financial costs to Montana citizens and communities as well as to our rural areas that would result from this increase in coal train traffic.

An increase in the number of trains would mean more frequent and longer traffic delays at rail crossings. This would disrupt the business and commerce of all Montana communities bisected by the rail line. Delays due to increased coal train traffic would also disrupt residents and businesses in rural areas where at-grade, private crossings connect farms and ranches with public roads and highways. Already, idled trains that block rural private crossings are a major complaint of rural residents.

An increase in the number of trains would also result in a greater potential for vehicle collisions with trains and for pedestrian accidents. While the MBTL DEIS analyzes rail safety impacts from the proposed action in the project area and along selected rail routes in Washington,[24] it ignores rail safety impacts in Montana. Coal train traffic to and from MBTL

[24] Millennium Bulk Terminals—Longview Draft SEPA Environmental Impact Statement. Section 5.2 Rail Safety. pp. 5.2-1.

would negatively impact Montana rail routes and the communities they bisect equally as that traffic affects those routes and communities in Washington.

Importantly, for all communities and rural areas, an increase in the number of trains decreases access across the train tracks. This is especially problematic for emergency services such as fire trucks and ambulances. With an additional 16 full-length coal trains on the rails, emergency responders and other emergency services would be further delayed in reaching residents when there is a medical emergency, a fire, or the need for police. Several medical emergency conditions are time-sensitive. In certain stroke patients, five minutes may make the difference between being able to treat the patient with thrombolytics or not (in certain stroke patients, thrombolytics can reverse devastating neurological effects of a stroke). In heart attack victims, a delay of minutes can result in heart muscle death. And, in major traumas, time delays can result in increased blood loss and organ failure.[25] These impacts are a connected and cumulative impact of the proposed MBTL project and must be recognized and thoroughly examined in the environmental analysis. These connected and cumulative issues must be considered by permitting officials at the Washington State Department of Ecology and Cowlitz County.

Sixteen additional full-length coal trains in Montana means an increase in the amount of airborne pollutants (particulate matter) from diesel engines as well as from coal dust. Additionally, more trains would mean more vehicles idling at train crossings when trains are passing – adding their exhaust (containing particulate matter and other pollutants) into the air. Particulate matter is solid matter suspended in air. Particles 10 microns in diameter or smaller are directly linked to health concerns. Diesel fumes contain particles that are 2.5 microns in diameter.

Medical studies have shown a clear link between both diesel air pollutants and coal dust and disease. Increased exposure to diesel fumes can lead to impaired pulmonary development in adolescents; increased severity and frequency of asthma attacks, ER visits, and hospital admissions of children; increased rates of heart attacks in adults; increased and measurable pulmonary inflammation; and an increased risk of cancer. Increased exposure to coal dust is associated with chronic bronchitis, emphysema, and pulmonary fibrosis. (Coal dust also results in increased environmental contamination through the leaching of toxic heavy metals, including mercury.) While those with chronic disease, the elderly, young children, and pregnant women are most at risk, the health effects from particulate matter exposure may occur years later, so even healthy individuals need to be concerned.

Section 5.6 of the MBTL DEIS addresses air quality impacts of the proposed action, and Section 5.7 assesses coal dust and its impacts. However, Montana is once again excluded from the review and analysis. Air quality implications of the proposed action in some Montana rail communities may be even more serious than in Washington communities. Both Missoula and Helena, Montana (which are crossed by the rail line that would be used by the coal trains traveling both directions between the PRB mines and MBTL) experience air quality inversion events and are regularly unable to meet National Ambient Air Quality Standards (NAAQS) for

[25] Dr. Eric Schultz in "Health concerns about coal export in the Northwest," Power Past Coal, 2013. http://powerpastcoal.org/wp-content/uploads/2013/12/health-impacts-03.pdf

certain pollutants, including particulate matter (PM_{10} and $PM_{2.5}$). The proposed action could have severe impacts to these communities, and the agencies preparing the environmental analysis must take these cumulative and connected impacts into consideration in their review.

In a paper titled, "PRB Coal Degradation, Causes and Cures," Roderick J. Hossfeld and Rod Hatt explain that "PRB coal is extremely friable [crumbly] and will break down into smaller particles virtually independent of how the coal is transported or handled." The authors go on to say that "once PRB coal is exposed by mining, the degradation process begins – the majority of the damage can occur in a very short time, even as short as a few days. The extent of the degradation that occurs depends in large part on . . . how long the coal is exposed to the atmosphere during transportation."[26]

Another study by Daniel A. Jaffe et al.[27] measured particulate matter (PM) emissions at two rail sites in Washington State. The "measurements demonstrate that rail traffic emits substantial quantities of diesel exhaust and that $PM_{2.5}$ concentrations are significantly enhanced for residents living close to the rail lines. . . . after passage of coal trains there was a statistically significant enhancement in large particles . . . [that] most likely consist of aerosolized coal dust." the Jaffe study goes on to state that "the enhancement in $PM_{2.5}$ is not only due to the [emission] spikes that occur as a train passes, but also the residual that accumulates in the local airshed."

Additionally, a report by Dr. Alan Lockwood,[28] found that coal trains are responsible for releasing coal dust particles and diesel fumes "into the air, degrading air quality and exposing nearby communities to dust inhalation," and the report specifically noted that "railroad engines and trucks release over 600,000 tons of nitrogen and 50,000 tons of particulate matter into the air every year in the process of hauling coal, largely through diesel exhaust. Diesel engines currently produce approximately 1.8 million tons of NO_x [nitrogen oxides] and 63,000 tons of small particles (less than 2.5 microns in diameter) each year. These emissions adversely affect many organ systems." It is worth noting that children often face the most severe health risks from coal dust pollution, with Dr. Lockwood noting that children and infants are the most vulnerable population in five of eleven enumerated diseases caused by coal dust pollution.

The air pollution associated with a dramatic increase of 16 additional coal trains per day through Montana communities and rural areas along the rail lines would have serious public health impacts for local residents. Cumulatively, thousands of Montanans live near the rail lines and would experience these increased health risks. The health impacts associated with this project should be included in the MBTL DEIS; however, it is our understanding that the health impact assessment (HIA) for MBTL's proposed action is not included in this DEIS. It is also our understanding that the HIA will not be completed until a review of the DEIS has been completed by an HIA Steering Committee.

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[26] "PRB Coal Degradation – Causes and Cures." Roderick J. Hossfeld, Jenike & Johanson, Inc., and Rod Hatt, Coal Combustion Inc. http://krtcommodities.com/files/PRB%20COAL%20DEGRADATION.pdf

[27] "Diesel Particulate Matter Emission Factors and Air Quality Implications from In-Service Rail in Washington State, USA" January 2014. http://www.atmos.washington.edu/jaffegroup/uploads/Jaffe_2014_trains_final.pdf

[28] "Coal's Assault on Human Health," Dr. Alan Lockwood, et al., November 2009. http://www.psr.org/assets/pdfs/psr-coal-fullreport.pdf

It seems to us irregular to publish a DEIS that lacks a HIA. We consider this a major deficiency with the DEIS. The lack of a HIA limits the public's ability to comment on one of the most important aspects of this proposed project's impacts: public health. What Northern Plains finds additionally concerning is that it is not clear that the HIA will include impacts to Montanans nor that the public will have an opportunity to comment on the HIA. We respectfully request that you allow the public to provide comments for the HIA even if the public comment period has to be separated from that of the DEIS.

Trains are noisy; more trains means more noise. Medical literature links noise to significant human health issues including cardiovascular disease, hypertension, arrhythmia, stroke, and ischemic heart disease; sleep disturbance and resultant fatigue; an increased rate of accident and injuries; cognitive impairment in children; and exacerbation of mental health disorders such as depression, stress and anxiety, and psychosis. Not only does noise impact humans, but it would impact wildlife and livestock. Noise impacts to livestock can include loss of weight, which would affect the rancher's profitability when the livestock is sold at market.

The MBTL DEIS states: "because the Proposed Action would result in more rail traffic on BNSF [Burlington Northern Santa Fe] main line routes, average noise levels would increase." We couldn't agree more. The DEIS goes on to provide a summary table of existing train volumes compared with anticipated 2028 baseline train volumes and projected 2028 train volumes when proposed action-related trains are added. This useful table very clearly compares train volumes for these different scenarios on the BNSF lines in Washington but ignores train volumes and increases in noise pollution for all scenarios on rail lines in Montana. As is stated above in these comments, the trains that would traverse Washington on their way to and from the proposed terminal would also traverse Montana. Noise pollution impacts and train volume increases along the rail line in Montana are a cumulative and connected impacts of the proposed action and must be considered in the EIS.

These significant health issues are connected and cumulative impacts of the proposed MBTL project and must be recognized and thoroughly examined in the environmental analysis. These connected and cumulative effects must be considered by the decision makers.

Increased coal train traffic from the PRB mines to the proposed MBTL would directly lead to increased financial costs to Montana communities and taxpayers. For example, federal law requires train engines to blow when approaching a crossing, whether that crossing has guard arms that come down or not. There is a process that communities can go through to establish "Quiet Zones" in order to eliminate the sound of train horns. But, the citizens of any Montana community wanting a Quiet Zone generally will have to pay for the infrastructure upgrades required that allow trains to not blow their horns.

It is understood that if a rail company needs to upgrade its track or a bridge or a tunnel or a crossing in order to facilitate current or increased train traffic, they will do so and they will pay for it. However, if a city or county wants to have a particular crossing in their community upgraded to deal with local impacts and the rail company doesn't want to do this, under existing law the railroads do not have to respond to the local government concerns.

Billings would be significantly affected by this increase in the number of coal trains as it is a bottleneck for rail traffic – all outgoing coal trains from the PRB headed for MBTL pass through that community. Billings taxpayers would need to fund the construction of an underpass downtown (between Montana Avenue and Minnesota Avenue) at the cost of at least $19 million to relieve traffic congestion. Helena taxpayers would need to pay around $13 million for an overpass at Montana Avenue in the middle of town as well as more than $1 million to facilitate a Quiet Zone. Missoula taxpayers would need to fund a yet-to-be-estimated multi-million dollar underpass or overpass to connect the populous Rattlesnake Creek area with downtown. Smaller Montana communities would similarly be affected.

These significant costs to Montana taxpayers are connected and cumulative impacts of the proposed MBTL project and must be recognized and thoroughly examined in the environmental analysis. The connected and cumulative effects of this project to Montana taxpayers must be considered by the decision makers.

Finally, an increase in the number of trains could increase the number of wildfires in Montana. The dry, windy conditions found in southeastern and central Montana can favor fire risk and its spread. Worn brakes, sparks from brake shoes or wheels, arcing from traction motors, failed wheel bearings, dripping oil, sparks smoldering on old creosoted cross-ties, and thrown rods from locomotives all have the potential to start fires. Because of reduced employee numbers on trains, a train-caused fire might not be detected until it is burning more intensely. The potential for more wildfires that are the result of increased train traffic is a connected and cumulative impact of the proposed MBTL project and must be recognized and thoroughly examined in the environmental analysis and considered by the decision makers.

Since 2012, many city governments, county governments, and elected Boards of Health in Montana have taken advantage of multiple public comment opportunities to weigh in with their concerns about the impacts of increased coal train traffic that would result from constructing additional coal export infrastructure. The various public comment opportunities have come in the form of NEPA scoping comment periods and draft environmental impact statements from a variety of agencies, incuding the Washington Department of Ecology, Cowlitz County, the Army Corps of Engineers, and the Surface Transportation Board. The various letters and resolutions expressing concern over the economic, public health, and infrastructure impacts of coal export-related increases in coal train traffic have come from: The City of Livingston, Gallatin City-County Board of Health, City of Helena, Lewis & Clark City-County Board of Health, City of Missoula, Bonner-Milltown Community Council, Missoula County, Missoula City-County Board of Health, Missoula City-County Air Pollution Control Board, and the City of Whitefish. A sampling of these letters and resolutions are included as addenda to this letter. The concerns of these local governments should be considered as the Washington Department of Ecology and Cowlitz County prepare a final environmental analysis.

Increased Coal Strip and Longwall Mining Due to MBTL

If the proposed MBTL coal export facility is approved, it would mean more coal strip mines and mining in the PRB with more impacts to the land, air, water, wildlife, and people in those areas. In their scoping report for the MBTL DEIS, Washington State Department of

Ecology and Cowlitz County declared that they would not consider mining impacts induced by MBTL in the DEIS for the project. Respectfully, we do not believe that the Washington State Department of Ecology and Cowlitz County can adequately complete a thorough and accurate environmental analysis for MBTL without considering the cumulative and connected impacts of additional coal mining induced by the proposed action. The final EIS should include this consideration of mining impacts.

Coal strip mining industrializes ecologically important areas that are also home to vibrant and economically important agricultural communities. Strip mining completely destroys the land, which is often productive agricultural land. Topography is obliterated, vegetation is scraped away, aquifers and other water sources are destroyed, livestock must be moved, and quiet areas become filled with noise. These changes can and do affect the profitability of any ranch near the coal strip mine.

The air quality at coal strip mine sites is often degraded. Coal mining operations include scraping off overburden soils, digging, drilling, blasting, dragline operation, and loading and unloading coal. In the dry and windy environment of the PRB, mining activities that denude the soil will eventually lead to blowing dust, dirt, and debris. As a result of both blasting and mine operations, particulate matter and coal dust are in the air at any coal strip mine. Coal dust not only affects the health of the mine workers but has a negative effect on the surrounding environment. There is also the potential for emissions of nitrogen oxides ("orange clouds") as a result of blasting operations. Nitrogen oxides can rise into the air and present a health threat to people at the mine and those living nearby.

Water is a precious resource in the semi-arid region of the PRB in Montana where coal is strip mined. Coal seams are filled with water and function as vital aquifers in this region. Coal strip mines sever and destroy these aquifers. The impacts of this severance can be seen many miles from the mine. Not only do down-gradient wells and springs dry up when the aquifer is severed, but springs and seeps above the mine that are hydrologically tied to the coal-seam aquifers will be drained and will dry up. Many of these springs are important sources of water for livestock (as well as wildlife) and require no electricity for pumping and, thus, are a valued resource. These springs also provide runoff for intermittent and ephemeral streams and pools that support riparian vegetation, which is important if not critical habitat for numerous wildlife species, including amphibians, migratory birds, and a diversity of aquatic life especially adapted to these environments.

Ranchers and other residents who live in the area rely on surface waters for irrigation and agricultural production. Shallow aquifers provide water for domestic and livestock use as well as sub-irrigate the agricultural land. Those who live farther from surface water sources rely principally on groundwater wells for their water. Often there are many maintenance-free springs and seeps in the area that are used by both wildlife and livestock. The quality of water greatly affects the operation of a ranch. In the arid western United States, good quality water is a scarce commodity. Poor quality water can rob producers via decreased performance (growth, reproduction) and has resulted in acute illness and death in livestock (and wildlife). Soils surrounding coal seams and the underground aquifers in coal seams are highly laden with sodium

salts. Improper discharge of these sediments and waters will impact the surface water quality and can sterilize the soil.

Coal strip mines notoriously have large footprints beyond the actual area where coal is being blasted and dug out of the ground. Many miles of roads, rail lines, tipples and conveyor systems, utility lines, buildings, storage areas, fencing, and sewage disposal areas as well as noise, lights, and a myriad of traffic and machinery will be part of the landscape of a coal strip mine. All of this development has environmental consequences for the wildlife that inhabit the relatively quiet, rural, undeveloped area. Construction activity, mine operation, increased human presence, increased traffic, noise, disruption of water resources, fencing, and many other factors that a strip mine entails have negative impacts on a variety of species. Wildlife does not just move to adjacent areas or even distant areas when development occurs. Therefore, wildlife conflicts increase when coal strip mining expands, and wildlife deaths are the most common result of these conflicts. Historic game migration corridors are disrupted not only by the coal strip mine but also by fences put in to keep wildlife out of mine areas. Wildlife access to water is often blocked. Biologists have documented dramatic decreases in some wildlife populations in areas of the PRB developed for coal strip mines.

Prairie bird species (both game birds and non-game resident and migratory species) are an important ecological component of the short-grass prairie where coal strip mines are generally located. Many of these species are struggling due to declines in this once wide-spread habitat. Raptors such as burrowing owls, short-eared owls, golden eagles, ferruginous hawks, and merlins often inhabit these areas before mines are built and decline after operations begin. Many neo-tropical migratory species rely on rural prairie habitats and are negatively affected by coal strip mines. The sagebrush steppe is one of the most severely threatened bird habitats in the Intermountain West. Brewer's sparrow, sage sparrow, sage thrasher, and sage grouse are particularly vulnerable as sagebrush declines, which is happening due to habitat destruction and human disturbance that are the result of coal strip mines. Small creeks and intermittent streams and ephemeral channels are extremely important in the PRB area. Some of these areas are part of the last remnants of a once widespread Great Plains riverine-prairie ecosystem. A significant body of research in the Great Plains indicates that not only do intermittent streams support fish, but they also play an important role in the biodiversity of the region. Coal strip mining is impacting this habitat.

And, then there is reclamation — or lack thereof. Despite federal and state laws that mandate reclamation following coal strip mining, it is not happening. There is a woeful lack of evidence of contemporaneous reclamation and/or reclamation success as measured by bond release throughout the West, and this is a significant issue in Montana.

Coal strip mines have been operating in Montana for more than 40 years. But as of September 2015, of the 41,005 acres that have been disturbed by coal strip mining operations, only 20,290 acres have achieved Phase I reclamation and bond release, which means that a permittee has completed the backfilling, re-grading, topsoil replacement, re-contouring, and drainage control required for a bonded area. Of particular concern, during this time only 491

acres in all of Montana have achieved Phase IV bond release.[29] This bond release verifies that all surface coal mining and reclamation activities and all disturbed lands within any drainage basin have been reclaimed in accordance with Phase I, II, and III requirements (and includes successful restoration of the hydrologic balance that supports post-mining land use).

The financial backer of MBTL is Lighthouse Resources, which is wholly owned by Cayman Islands hedge fund RCF. Lighthouse also owns and operates the Decker coal mine in southeastern Montana. Of all of the major strip mines in Montana and Wyoming, the reclamation record at Decker is quite possibly the worst. Despite being in operation for more than 40 years, the Decker Mine has achieved exactly 0 acres of full reclamation out of 7,745 acres mined. This is according to data from the Office of Surface Mining Reclamation and Enforcement's surface mine reclamation tables for Evaluation Year 2015.

The Surface Mining Control and Reclamation Act (SMCRA) requires that coal companies complete "contemporaneous" reclamation, and the Decker Mine's poor reclamation record is both an indicator of Lighthouse Resources' poor stewardship of the land and natural resources entrusted to them via government permits as well as a legal liability for the company, which, as recently as January 27, 2016, testified to the BLM's Regional Coal Team for the PRB that it intends to expand its mining operations at the Decker Mine fivefold – to increase production from approximately 3 million tons of coal per year to 15 million tons of coal per year – for the sole purpose of export via MBTL. If the Proposed Action is permitted, the landowners, neighbors, and public land users at or near the Decker Mine face rapidly expanding impacts to the land and water of southeastern Montana with no promise of timely reclamation of the disturbance. This is a cumulative and connected impact of permitting the MBTL project, and this issue must be considered and analyzed in this environmental analysis.

The connected and cumulative impacts to the land, air, water, and wildlife in the PRB and Montana from strip mining the coal that will be moved through the MBTL coal export facility are significant and must be recognized and thoroughly examined in the environmental analysis. These connected and cumulative effects of the MBTL project must be considered by the decision makers.

Increased Greenhouse Gases and Climate Change Due to MBTL

The sole purpose of the MBTL is to export coal. Coal is the world's most carbon-intensive fossil fuel. When coal is burned, carbon dioxide (CO_2) and other greenhouse gases (GHG) are released into the atmosphere (conversely, this CO_2 is trapped as carbon inside the coal in the ground and does not impact the earth's atmosphere). It is now well-established in the scientific community that the burning of coal and other fossil fuels is putting us on a dangerous path toward irreversible climate change.[30] According to the 2009 *U.S. Global Change Research*

[29] "Undermined Promise II," Western Organization of Resource Councils, Natural Resources Defense Council, and National Wildlife Federation. 2015 (http://underminedpromise.org/UnderminedPromiseII.pdf) ***and*** *Cumulative Montana Reclamation Status Table EY-1999 to Present [September 2015]*. Personal communication from OSMRE Program Analyst Frank Bartlett, Sept. 23, 2015.

[30] Fact Sheet: Social Cost of Carbon, EPA (Nov 2013), http://www.epa.gov/climatechange/Downloads/EPAactivities/scc-fact-sheet.pdf.

Report,[31] "The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come from the burning of fossil fuels (coal, oil, and gas), with additional contributions from the clearing of forests and agricultural activities." The potential climate impacts that would result from the proposed MBTL coal export terminal cannot be ignored. Full consideration must be given to the long-term, connected, direct, and indirect impacts that the proposed MBTL project would have on global climate change.

Construction and operation of the proposed MBTL would have direct climate impacts due to diesel combustion emissions both from transporting materials and operating equipment for the construction of the export terminal and from operation of the railroad bring coal to the MBTL. The principal climate impacts, however, would be indirect and would come from the combustion of the coal exported from MBTL, an undeniable cumulative and connected impact of the construction and operation of MBTL.

Virtually every ecological community and natural system in Montana, and, indeed, the world, is already being impacted by global climate change. These impacts will continue to become more and more severe unless the use of coal is dramatically curtailed and all nations make a concerted effort to develop other forms of energy. Wherever the PRB coal that is transported to the MBTL coal export facility is burned, the GHG emissions will eventually impact Montanans.

Within the last century, Montana has seen a 1.3°F increase in its average temperature.[32] The Intergovernmental Panel on Climate Change has projected that, within the 21st century, temperatures will increase 4°F in the spring and summer months and 5°F in fall and winter. In Montana, increasing temperatures are:

- leading to a loss of snowpack through earlier snowmelt with resulting effects on the water supply available for humans, livestock, crops, fish, and wildlife. Snowpack in Montana holds about 75 percent of the State's water supply. Less snowfall and earlier snowmelt affects aquifer recharge, stream flow, and stream temperature. Early snowmelt also produces an increase in stream flow in winter and spring but a reduction in summer and fall flows. This is detrimental because the summer and fall flows are critical for irrigation, power generation, fishery protection, recreation, and other uses.
- leading to extreme heat waves. In general, heat waves are already occurring at a more frequent rate, thereby increasing mortality and morbidity. EPA studies indicate that Montana is particularly susceptible to more heat waves since it already has irregular, intense heat waves as part of its weather pattern. Heat waves produce a variety of problems, including increased fatalities among the elderly and other vulnerable populations. They also increase the spread of pests and invasive species. In reference to pests, EPA has reported that mosquito populations having the potential to carry encephalitis already exist in Montana. As conditions become warmer, the habitat for

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and http://climate.nasa.gov/scientific-consensus/

[31] http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf

[32] *Climate Change and Montana*, EPA, 1997, http://www.spatialsci.com/files/images/EPA_MT_climchange.pdf

disease-spreading insects and pathogens will likely expand and create a greater risk of infection for Montanans.

- increasing the danger of wildfires. Wildfires are already becoming more prevalent and destructive in Montana, especially during summer months. During the period from 2000 through 2007, three National Forests in Montana experienced a loss of over 1,420,000 acres of land due to wildfires. Moreover, in fiscal year 2008 alone, Montana spent $84.3 million on fire and damage control. The 2012 fires in southeastern Montana alone burned 421,006 acres and cost $16.5 million to fight. These costs to the State will only increase as global warming escalates. Wildfires also release huge quantities of CO_2 thereby creating a feedback loop that drives global warming ever higher.

Climate change is expected to have significant impacts on water supplies and the productive capacity of agricultural lands. In Montana, agriculture is the state's largest industry and comprises 64% of the state's land area. Along with the problems for water supplies that result from climate change in Montana, increasing summer temperatures can negatively affect cattle and crops, reducing weights and yields, respectively. Climate change also results in more violent storms and other weather pattern changes during other seasons. Agricultural producers are greatly affected by these changes not only for how it affects their operations but also because these changes often result in economic losses. As Northern Plains member Mark Fix testified in the 2014 EPA hearings on the draft Clean Power Plan, climate change is resulting in more violent winds and hail storms during spring and summer, which harm and destroy cattle and crops. There are more cold temperatures for longer periods of time during some winters and, increasingly into spring. These changes particularly can negatively impact calf survival.[33]

According to Dr. Steven Running, a University of Montana climate scientist, 30 years ago snow melts in Montana occurred around the beginning of April. In recent years, they have occurred in mid-March, and this trend is only continuing. The growing season currently begins a month earlier than it did 30 years ago, and summers are longer, hotter, and drier with lower river flows and more wildfires.

In this DEIS, the Washington State Department of Ecology and Cowlitz County fail to take into account the social cost of carbon. Under the leadership of the Office of Management and Budget (OMB), the social cost of carbon was developed by a dozen federal agencies and offices in 2010 (and updated in 2014); it is the best existing tool to help agencies and the public make decisions regarding projects that impact the climate. The social cost of carbon estimates the global financial cost of each ton of extra carbon pollution in the atmosphere and seeks to incorporate impacts as diverse as drought, fire, diminished agricultural productivity, and more.[34] The social cost of carbon is backed by years of peer-reviewed scientific and economic research and has already been used by agencies in both rulemaking and project-level NEPA [National Environmental Policy Act] review.

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[33] Testimony of Mark Fix on behalf of Northern Plains Resource Council at the Denver, Colorado, EPA hearings on the draft Clean Power Plan, July 29, 2014

[34] "Refining Estimates of the Social Cost of Carbon," Howard Shelanski, White House Blog. November 1, 2013. https://www.whitehouse.gov/blog/2013/11/01/refining-estimates-social-cost-carbon and "The Social Cost of Carbon," Environmental Protection Agency. retrieved June 10, 2016. https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html

In June 2014, a U.S. District Court ruled against the federal government in *High Country Conservation Advocates, et al. v. U.S. Forest Service, et al.* citing, among other things, its failure to analyze the social cost of carbon.[35] After this decision, and in response to a letter from more than two dozen conservation organizations, the U.S. Department of Agriculture affirmed that the social cost of carbon is an "appropriate tool for measuring and disclosing the social and economic implications" of federal coal leasing decisions.[36] The Washington State Department of Ecology and Cowlitz County's failure to examine the social cost of carbon associated with the Proposed Action is a significant deficiency and makes the GHG analysis of this DEIS inadequate.

These significant social and environmental costs of carbon to Montana and Montanans are connected and cumulative impacts of the proposed MBTL project and must be recognized and thoroughly examined in the environmental analysis. These connected and cumulative effects must be considered by the decision makers.

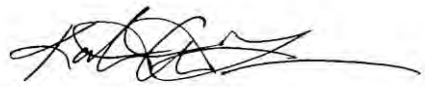
Conclusion

Coal company commercials and politicians tout "clean coal" ─ and tell us that coal is cheap. But there is no such thing as "clean coal" and if we honestly calculated the costs of coal to the land, to our health, and to our planet, we would find that coal is not cheap. What is happening now is that the significant costs of coal are shifted into the future and onto others while the coal, rail, and terminal corporations pocket any profits. The true costs of coal are being externalized.

We believe that the Washington State Department of Ecology and Cowlitz County must fully consider the consequences of all the connected and cumulative impacts that would result to Montana and Montanans if a permit is granted for the proposed MBTL coal export terminal. These comments are submitted with the hope that the decision makers will recognize that the DEIS prepared for this project is grievously deficient with regard to the issues we raise and to our concerns.

Thank you for the opportunity to participate in this important public process.

Sincerely,



Kate French, Chairperson
Northern Plains Resource Council

Nancy Hartenhoff-Crooks, Chairperson
Western Organization of Resource Councils

[35] "Court Blocks Coal Mine Expansion for not Counting the Costs of Carbon Pollution," Nidhi Thakar, June 2014, http://thinkprogress.org/climate/2014/06/30/3454764/court-blocks-arch-mine-coal-expansion/
[36] Letter from Robert Bonnie, Under Secretary for Natural Resources and Environment, U.S. Department of Agriculture, to J. Nichols, WhildEarth Guardians (Mar. 6, 2015).

PO Box 376, Milltown MT 59851

June 13, 2016

Missoula County Commissioners
200 W Broadway
Missoula MT 59802

Dear Commissioners:

The Bonner Milltown Community Council (Council) requests that you approve our submitting this letter to the Washington State Department of Ecology as our public comment on the Draft Environmental Impact Statement for the proposed Millenium Bulk Terminals coal export proposal at Longview, Washington.

The Proposed Action would create important adverse impacts in Missoula County. Eight loaded and 8 empty coal trains would pass through the County daily. Forty four million metric tons of coal would be exported annually to markets in Asia where it would be burned in coal-fired power plants.

Climate change.

- "The international scientific community is in agreement that human activities have contributed – and continue to contribute – to climate change. One of the primary causes of climate change is the emission of greenhouse gasses…" (DEIS 5.8-2)
- Greenhouse gas emissions – The Proposed Action would annually generate 3,192,548 metric tons of CO2 when the coal is burned in Asia (DEIS Sect 5.8)
- Induced impact – The export of this large amount of coal would lower coal price on the international market and stimulate additional coal consumption and additional adverse climate impact (DEIS Sect 5.8)
- Climate change impacts expected in Washington State will be mirrored in other Pacific Northwest states. An example is the "snow water equivalent," which is forecast to "decline (in Washington State) by almost half (46%) by the 2040s and virtually disappear by the 2080s, greatly reducing streamflow in some areas." (DEIS Sect 5.8.2.4). Climate change impacts resulting from the increase in greenhouse gasses persist for a long period of time, are considered permanent, and are global in nature.
- The emissions attributed to the Proposed Action would be adverse and significant (DEIS Page 5.8-16)

Rail traffic impacts upon neighboring states were not evaluated in the DEIS

Although the DEIS is thorough and well documented for Washington State, impacts outside the State are not considered. While this omission is inherent in an action that is a fulfillment of Washington State law, it is a serious shortcoming in the DEIS process because it ignores impacts upon neighboring states. Impacts of one's actions upon neighbors are essential considerations.

The frequency of Rail accidents in Washington State are estimated in the DEIS using historic data. The observed frequency of accidents on BNSF track in the State is 2 accidents per million miles of train travel (DEIS Page 5.2-4). In Montana, approximately 200 miles of MRL track is adjacent to the Clark Fork River. Eight loaded coal trains/day would travel 1600 miles/day along the River. In a year, train travel adjacent to the Clark Fork would add up to 584,000 miles and be accompanied by the likelihood of 1 accident each year. **Impacts of a coal spill** upon the Columbia River were evaluated in the DEIS and expected to have minor consequence upon the River and aquatic life. The Clark Fork has aquatic geological and biological characteristics very different from those of the Columbia. The adverse consequences of a coal spill into this river are unknown, and could be seriously adverse. "…whether the alterations (from coal released into the aquatic environment) are significant enough to be potentially toxic to aquatic organisms depends on many factors, including the type of coal, the relative amount of time the coal is exposed to water, dilution, and buffering."(DEIS Page 4.7-33)

Delays of emergency vehicles at rail crossings outside Washington State were not evaluated. In the area served by the Bonner Milltown Community Council there are four MRL/BNSF rail crossings, two of which have no alternate road to residential areas. Using the 6,844 foot length of a coal unit train traveling at 50mph for calculation, the 16 trains/day (8 loaded, 8 empty) will add a half hour's delay every day to each crossing. Local emergency services have had no opportunity to evaluate potential consequences of this added delay, which would be longer if train speeds are slower.

Health impacts of coal dust were evaluated for Washington State only (DEIS Section 5.7). Of special concern were particles 10 microns and smaller, referred to as PM10 sized particles, and those 2.5 microns and smaller, PM2.5 sized particles. PM10 and PM2.5 particles are small enough to penetrate deep into the lungs and may even enter the bloodstream (EPA, https://www3.epa.gov/pm/health.html). Air monitoring equipment operated by Washington State along BNSF main lines detected no exceedances of federal standards.

However, an important shortcoming of the DEIS is the failure to address the long-term health risk over the lifetime of the proposed action (expected to be a minimum 30 year period, DEIS Page 2-11). Clearly, there would be long-term health consequences to residents in the vicinity of rail lines from the liberation of PM10 and PM2.5 particles from 2,920 loaded coal trains traveling each year for 30 years. Evidence that significant particulates are emitted from coal trains is bolstered by the existing need to re-apply surfactant topper agents one additional time during transport from the Powder River origin to the Longview, Washington destination. The extremely small size of PM10 and PM2.5 particles (the human red blood corpuscle is 7 microns in diameter) makes them invisible, broadly dispersible into the human environment, and present as an undefinable and adverse long term impact upon human health.

The Bonner Milltown Community Council strongly recommends the "No Action Alternative" (The Proposed Action to export coal from the Longview Terminals would not take place) because of:

1. The intolerable impact upon climate of increased greenhouse gas emissions resulting from the Proposed Action.
2. The failure of the DEIS to address significant impacts of the Proposed Action upon neighboring states.

Don Felton	Burt Caldwell
Olivia Riutta	Gary Matson
Shelly Cook	

Resolution Number 7701

A resolution of the Missoula City Council to request that the U.S. Army Corps of Engineers prepare a comprehensive Programmatic Environmental Impact Statement (PEIS) on the cumulative impacts of new coal export terminals in Washington and Oregon and hold public hearings in Missoula, Montana and other communities that will be significantly impacted from coal that will be transported by train from the Powder River Basin in Montana and Wyoming to terminals along the Pacific Coast.

Whereas, currently, there are four coal-export terminal projects pending before the Corps: the Gateway Pacific Terminals ("GTP") site at Cherry Point, Washington; the Millennium Bulk Logistics ("MBL") site at Longview, Washington; the Oregon Gateway Terminal at the Port of Coos Bay, Oregon; and the Coyote Island Terminal site at the Port Morrow, Oregon. Additional permit applications are anticipated for a Kinder Morgan project at the Port of St. Helens, Oregon, and the RailAmerica proposal at the Port of Grays Harbor, Washington. Additionally, existing export terminals at port facilities in British Columbia are already receiving coal shipments and are considering expansions of their own; and

Whereas, taken together, the announced capacity of the planned U.S. projects is approximately 150 million tons of coal per year (compiled by Northern Plains Resource Council through press releases on each proposal). Operating at full capacity, these plans would mean approximately 60 coal trains – each about a mile and half long – moving through the Pacific Northwest, every day, year round. Many of these trains will pass through Missoula, Montana, and will potentially result in a significant adverse effect on our community that should be considered in any environmental review of these proposals.

Whereas, to ensure each individual permitting action accounts for the significant cumulative impacts of and mitigation for multiple proposed northwest coal export terminals, we believe that the Corps of Engineers must first prepare a PEIS that carefully analyzes the combined impacts of multiple, similar coal export terminal proposals.

Whereas, such analysis is allowed for, and most likely required, under the National Environmental Policy Act (NEPA). Under Section 1508.25(a)(1) and (2) of the Council of Environmental Quality's NEPA regulations, this environmental review must collect, analyze, and consider connected and cumulative actions for any federally supported project. Further, "cumulative" and "similar" actions should be discussed within a single environmental impact statement, necessitating the development of a PEIS.

Whereas, The railroad tracks and rail yard cut through a significant portion of the City of Missoula. In particular, the crossing at Greenough and Madison could cut off the Lower Rattlesnake neighborhood from vehicle by pedestrian travel, not to mention emergency services, item trains and increased traffic will result in additional emissions of air pollutants including greenhouse gases.

Whereas, any environmental analysis of these proposals must consider the negative effects that burning the large volumes of coal would have on the climate. Domestic demand for coal in the Powder River Basin has been rapidly declining. As a result, this coal will be shipped overseas to Asia, where it will permanently shape the developing energy markets there. With access to our cheap coal, countries in Asia will be induced to build new coal-fired power plants instead of transitioning to cleaner energy sources. This will lock in reliance on coal as a source of energy for the life of these power plans (thirty plus years), with an astronomically negative effect on climate change.

Now therefore be it resolved that the Missoula City Council requests that environmental reviews of these proposals consider the effects on the City of Missoula and other impacted communities.

Be it further resolved that we urge the U.S. Army Corps of Engineers to conduct a comprehensive programmatic EIS that includes an analysis of all of the indirect and cumulative environmental impacts, including the impacts on Montana communities, from all proposed coal ports in the Pacific Northwest.

Be it further resolved that we request that U.S. Army Corps of Engineers hold a public hearing in Missoula, Montana.

Passed and adopted this 21st day of May, 2012.

Attest:

/s/ Martha L. Rehbein
Martha L. Rehbein, CMC
City Clerk

Approved:

/s/ John Engen
John Engen
Mayor

(Seal)

Northern Plains Resource Council (2504)

Interim City Manager
Lisa L. Lowy

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June 1, 2016

City of Livingston

Incorporated 1889

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James Bennett

Vice Chairman
Dorel Hoglund

Commissioners
Mel Friedman
Sarah Sandberg
Quentin Schwarz

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave, Suite 550
Seattle, WA 98104

RE: Public Response to Millennium Bulk Terminal EIS

To whom it may concern,

This letter is being written in response to the Millennium Bulk Terminal EIS released for Public Comment on April 29, 2016. Upon review of the Draft Document it was noted that the operational and environmental impacts focused primarily on the regional impacts in Washington State and did not adequately address the down rail impacts to other areas, specifically those in Montana. Coal originating out of the Power River Basin Mines will travel the majority of the main rail lines through Montana and specifically through our community in Livingston.

Based on the outline in the EIS, the construction of this terminal and the ensuing increases in rail traffic would essentially double the rail traffic Livingston currently experiences. Our community has several unique characteristics which create extraordinary challenges for an increase of traffic on this magnitude. They are:

1. Our community is bisected by rail lines with only 1 grade separated crossings and two at grade crossings. We already suffer significant bottle necks in the flow of our local traffic due to rail traffic which at times can have all at grade crossings blocked leaving only one alternative route.
2. Additionally, loaded rail cars (especially heavier loads such as coal) require additional pusher engines in order to get over the Bozeman Pass which gains significant elevation upon exiting Livingston. Coupling and uncoupling these additional engines, which all occurs in our downtown railyard, would create further delays that would significantly impact traffic flow as well as impede the ability of emergency services to access the North side of our community. Additional air pollution related to the increased operations and added idling time of the engines presents additional quality of life and environmental impacts to our community.
3. Our community additionally has safety concerns for pedestrian traffic with increases of this magnitude in our community. All of the safe route to schools utilized by our children and families from the North side of our community require the crossing of operating tracks.

It is our hope that as the Public Comment period concludes, sufficient evidence and concern will be raised and acknowledged so that the down rail impacts to Montana and specifically in Livingston as well as an adequate plan to mitigate those impacts can be developed as part of the final EIS for this project. Thank you very much for your consideration of our concerns as it pertains to this EIS and we are available to discuss any of the items further.

Very truly yours,

James Bennett

James Bennett, Chairman
Livingston City Commission

Lisa L. Lowy, MHA
Interim City Manager

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City of Livingston

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Steve Caldwell

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Commissioners
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Mel Friedman
Bill Spannring

Mr. Randel Perry
U.S. Army Corps of Engineers, Seattle District
C/O GPT/BNSF Custer Spur EIS Co-Lead Agencies
1100 112th Avenue Northeast, Suite 400
Bellevue, Washington 98004

Subject: EIS Scoping Comments from Livingston, MT

Dear Mr. Perry,

The City of Livingston, Montana, population 7,500, is bisected by the southern main line of the Montana Rail Link/Burlington Northern Santa Fe railroad companies. The development of ports on Washington's coast will have an impact upon the City of Livingston by increasing train traffic. The City requests that the Army Corps expand its scope of the Environmental Impact Study for said ports to include an analysis of effects to the City of Livingston.

Increasing the number of trains through Livingston will exacerbate three issues currently facing Livingston, including 1. reduced access, 2. additional noise, and 3. potential health concerns from exhaust and coal dust.

1. **Access.** As the City is bisected by the rail line, three railroad crossings, two at grade, and one underpass serve as access points. These crossings are currently stressed with re-routing and congestion issues. Increased traffic will in turn increase access issues for citizens, businesses and emergency response vehicles.
2. **Noise.** Many citizens are currently impacted by train and whistle noise due to the central location of the rail line. Residents of Livingston have expressed considerable distress over potential increases in train noise from increased rail traffic.
3. **Potential Health Hazards.** Potential health hazards, including exhaust from increased idle time from waiting motor vehicles, increased diesel exhaust from the trains themselves, and coal dust from moving trains are a concern for Livingston.

Please consider this request to address the impact of the development of Washington ports and associated increases to rail traffic on the City of Livingston.

Sincerely,

Steve Caldwell
City Commission Chairman

Missoula Public Health
City-County Health Department

Missoula City-County Health Department
AIR POLLUTION CONTROL BOARD
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May 19, 2016

Dear Directors Placido and Toteff:

On May 17, 2012, the Missoula City-County Air Pollution Control Board (Board) submitted public comment to the Army Corps of Engineers regarding the numerous proposed coal export terminals in Oregon and Washington, including the Longview terminal. The Board administers matters pertaining to the Missoula City-County Air Pollution Control Program in order to require the use of all available practicable methods to reduce, prevent and control air pollution in the City and County.

Recognizing Missoula could experience significant adverse effects from the proposed operation of these terminals, the Board requested that a comprehensive programmatic environmental impact statement be conducted and include analyses of the terminals' indirect and cumulative impacts on Missoula and other Montana cities and counties. We understand this was given some consideration, as Montana is part of the study for the Longview Draft Environmental Impact Statement (DEIS). However, the document's coverage of Montana is cursory and deficient.

The Millennium Bulk Terminals-Longview (MBTL) State Environmental Policy Act DEIS mentions Montana in several contexts relating to rail use, air quality and climate change impacts. The document recognizes that many of these impacts in Montana will be serious and unavoidable.

We will address three of these impacts:

1.0 Air Quality.

The Missoula Valley lies in a bowl surrounded by hills and mountains, and experiences frequent air inversions that trap pollutants. This buildup of pollutants can result in air quality that becomes hazardous for human health - particularly sensitive groups. Missoula was designated non-attainment for PM10 upon the promulgation of the Clean

Air Act Amendments in 1990 and has not yet been removed from the list of PM10 non-attainment areas. In addition, fine particulate (PM2.5) levels in Missoula have come very close to exceeding the PM2.5 National Ambient Air Quality Standard (NAAQS). By significantly increasing the current number of trains through Missoula, an already sensitive air quality situation would be exacerbated. The DEIS finds that "increase in rail traffic would increase the emissions of criteria pollutants associated with rail transport." (Air Quality Fact Sheet, p.2)

Missoula's rail yard/switching yard bisects the downtown area, with thousands of residents living within two miles of the tracks. As acknowledged by the DEIS, inhalation cancer risks were highest in the major population centers along the rail route (Vancouver), with a cancer risk of up to 500 cancers per million. Smaller communities (Spokane, Yakima, etc.) had a risk of 300 cancers per million (Chapter 5, p. 9-10). While the exact number of additional trains the Proposed Action would bring through Missoula is not given, a doubling of the current 16.9 total trains per day would not benefit the health of residents near the rail yard

Comments: ***When will the Health Impact Assessment (HIA) be done and will we see it before the end of the comment period? The lack of a completed HIA is a serious deficiency in the DEIS.***

2.0 Rail Safety and Capacity.

Increases in coal trains without rail expansions "could result in rail traffic on some…segments exceeding capacity outside of Washington." (Summary p.30) The DEIS projects an increase of up to 16 trains per day (eight empty and eight full) traveling along Montana rail lines. All increases in rail use have the potential to increase risks of derailments and accidents across the cargo spectrum, possibly involving hazardous materials (such as crude oil). Catastrophic derailments and accidents involving hazardous cargo can affect air quality and endanger citizens' health and well-being. In addition, the City of Missoula has two at-grade crossings and two rail overpasses. Outside of the city, there are 10 additional at-grade crossings bisecting communities along the rail line. Blocked rail crossings can lead to delayed response times for emergency vehicles, increased emissions from idling vehicles and decreased ability to quickly evacuate populations during disasters such as wildfire and toxic spills.

Successful MBTL operation is contingent on successful movement of trains through Montana. The DEIS partially addresses this for Montana, stating, "Without improvements to rail infrastructure to expand capacity (and safety), the Proposed Action could result in an unavoidable and significant adverse impact on rail transportation." (Summary p. 53-54) Such improvements are not discussed specifically for Montana and Missoula County.

Comments: ***Please provide specific data regarding current and anticipated rail use and capacity through Montana. Who would be responsible for improvements? What mechanisms will insure that needed improvements are made? The lack of specificity in***

your Montana data makes it difficult to plan ahead. The DEIS must consider the cumulative impacts on the rails of all coal and oil-by-rail proposals, including the Tesoro Savage proposal.

3.0 Climate Change.

Increases in CO_2 from burning coal in Asia via the Proposed Action will contribute to climate change globally and locally. According to the DEIS, greenhouse gas emissions from the Proposed Action would exceed various national and state thresholds; the emissions would persist beyond the proposed analysis and would be considered permanent (Summary p.39). The DEIS states that mitigation measures "must achieve emission reductions that are real, permanent, enforceable, verifiable and additional. They may occur…outside of Washington State but must meet all five criteria." Emissions remaining after mitigation measures "would be significant and unavoidable, as described in Section S.7" (Summary, Table S.2, p. 58). Climate change "is global in nature"(Summary p.39), and Washington and Montana are already experiencing extreme heat and precipitation events, wildfire seasons that start earlier and end later, droughts (Chapter 5, Sec. 6.8, p.9), shorter winters with higher night-time lows, and opportunistic species (pine beetles, leafy spurge, etc.) that thrive and in some cases increase pollen counts. The Proposed Action supports infrastructure for burning coal for another 30 years and is antithetical to the December 2015 Paris agreement made by 195 nations to seriously work to reduce the threats of climate change to the planet by reducing the burning of fossil fuels.

Comments: ***The DEIS should more thoroughly examine MBTL in light of domestic and international climate goals and evaluate the proposed project in light of the social cost of carbon. In addition to climate impacts, the DEIS should examine the long-term financial viability of the proposal, given economic and energy source changes occurring both within the United States and abroad. It is imprudent to make significant infrastructure investments as markets shift away from coal.***

In conclusion, the proposed coal export terminal would create significant adverse impacts to our community, our region and the planet that cannot be mitigated. Because of these unavoidable and significant adverse impacts and because of uncertainties and missing essential information in the DEIS, we ask that you select the NO ACTION alternative. Thank you for considering our comments.

Sincerely,

Ross Miller, Chair
Missoula City-County Air Pollution Control Board

June 13, 2016

RE: Oregon and Washington Physicians for Social Responsibility Comments on Draft Environmental Impact Statement for Millennium Bulk Terminals Longview

To Whom It May Concern:

On April 29, 2016, Co-leads Cowlitz County and Washington Department of Ecology issued the draft Environmental Impact Statement ("DEIS") prepared under the State Environmental Policy Act ("SEPA") for the proposed Millennium Bulk Terminals Longview ("MBT") coal export project. Oregon Physicians for Social Responsibility (OPSR) and Washington Physicians for Social Responsibility (WPSR) have reviewed the document and supporting materials and submit the following comments. We incorporate by reference the comments of Columbia Riverkeeper *et al.,* Earthjustice, Friends of the Columbia Gorge, Greenpeace, Sierra Club, Stand, and The Lands Council.

The MBT project must be denied due to major and unavoidable consequences (identified in the DEIS) that could harm terminal workers, the people of Longview, the state, and the region, drinking water supplies, the Columbia River, and sovereign tribal nations. Despite some significant shortcomings, including the failure to incorporate a Health Impact Assessment (HIA), the DEIS confirms that MBT's operation would threaten public safety, public health, and salmon. Significantly, although the DEIS significantly understates the project's potential impact on greenhouse gas ("GHG") emissions, it confirms that MBT would be among the state's worst sources of carbon pollution.

SEPA regulations do not require a full cost-benefit analysis of projects. However, to the extent that economic information is included in the Final EIS (FEIS), it must include some independent review so as to be balanced, inclusive, accurate and fair. This DEIS provides a one-sided picture of economic benefits, without any countervailing assessment of economic harm. It fails to examine the cumulative costs of MBT, including costs of emergency department visits, hospitalizations, medications; lost days of school and work for patients and caregivers; and the stress associated with a significant drop in home values, for example.

However, the DEIS reveals many significant impacts and risks that, individually and collectively, provide a basis for the Co-leads to deny the project. Section S.7 summarizes the areas of impacts that cannot be mitigated. While we believe an accurate list of significant and unavoidable impacts would be both broader and deeper, this list alone provides a more than sufficient basis to deny this project under SEPA.

I. THE DEIS UNDERSTATES THE IMPACTS AND RISKS TO HUMAN HEALTH AND SAFETY

"The co-lead agencies received over 217,500 comments on the Proposed Action during the scoping period. Many of these comments expressed concerns about the Proposed Action." (DEIS Summary at S-9.) One of the three top concerns was health.

A direct impact of the proposed coal shipping terminal at Longview would be sixteen 1.3-mile-long trains traveling across the region and through Washington state each day, and adding 1680 deep-draft vessel transits to the Columbia River 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.

Although the DEIS describes risks to communities, it minimizes them and does not examine or predict with data the potential health risks resulting from its proposed actions. Risks to human health from massive coal shipments are numerous and complex. They can be immediate, synergistic, cumulative and/or long-term in nature. Overall, the DEIS lacks detail and overall substance in regards to the human health impacts of MBT. A comprehensive Health Impact Assessment should be performed in order to give proper consideration to human health in the FEIS.

A. The DEIS Fails to Disclose the Health Risks and Costs Associated with Climate Change to Residents of Washington State and the Region

1,700 national and international health associations representing 13 million doctors, nurses, and public health professionals call for an end to dirty energy and a rapid transition to a healthier world.[1] They include the American Medical Association, American Nurses Association, American Public Health Association, American Academy of Pediatrics, American Academy of Family Practitioners, American Academy of Allergy, Asthma, and Immunology, American College of Physicians, American College of Preventive Medicine, American College of Chest Physicians, American College of Sports Medicine, American Psychological Association, American Thoracic Society, American Lung Association, National Association of County and City Health Officials, Association of State and Territorial

[1] www.climate911.org

Health Officials, National Academy of Sciences, National Medical Association, and U.S. Centers for Disease Control and Prevention.

By facilitating the mining, transport, and burning of coal, the MBT project will contribute to climate change-induced injury and disease, including:

- Increased heat related illness and health care costs; [54, 57, 68] (Jackson et al., 2010; Knowlton et al., 2011; McCoy & Hoskins, 2014)
- Increased extreme weather events with associated injuries and deaths; [5, 52, 54, 72] (Ashley & Ashley, 2008; IPCC, 2012; Jackson et al., 2010; NOAA, 2012)
- Food supply disruption; [64] (Luber et al., 2014)
- Spread of infectious diseases;[64] (Luber et al., 2014) and
- Disproportionate adverse effects on low income and communities of color. [52] (IPCC, 2012)

Beyond the more obvious hazards associated with coal mining, transport, storage, and burning, there is an undeniable connection between increased fossil fuel usage and its impact on climate change and health. The science is clear that the earth is warming and that people, through the burning of massive quantities of fossil fuels, are the main cause of this rapid increase in global temperatures. Heat trapping and warming temperatures are a result of increases in atmospheric greenhouse gases, which efficiently absorb heat from the earth's surface and prevent outgoing thermal energy from radiating back into space. The coal carried by trains into Longview, when eventually burned, will significantly add to an already dangerous burden of greenhouse gases being emitted into the atmosphere.

Numerous studies, reported in leading scientific and medical journals, show that ongoing changes to our climate are correlated with: changes in rainfall patterns; worsening heat waves; an increased frequency and magnitude of extreme weather events, droughts, and fires; a rise in sea level; increased potency of allergens; and the spread of infectious diseases – all of which pose a real and serious threat to human health. Unless global carbon emissions start to fall within the next decade, we can expect to see further and more drastic changes in our climate, and related adverse health impacts all over the world.

Populations that could be most vulnerable to health impacts of climate change include those with:

- Demographic vulnerability: People with existing illnesses, people with disabilities, older adults, mothers, infants, children, people with low socioeconomic status, linguistically or socially-isolated populations, immigrants and refugees, communities of color, and American Indians
- Occupational vulnerability: Wildland firefighters, outdoor workers, growers, ranchers and farmworkers, emergency responders and health care workers
- Geographic vulnerability: Urban and suburban areas, coasts, steep slopes, and private water systems (Haggerty et al., 2014)

MBT's emissions will contribute to increased ground level ozone.

- Ground level ozone increases with hot weather, vehicle and diesel exhaust, gasoline vapors, and other outdoor air pollutants. Ground level ozone is known to irritate the respiratory tract, cause premature aging of the lungs, and has been linked to the development of asthma and exacerbation of existing asthma cases. In fact, people who spend more time being active in the outdoors working or playing are at greater risk for adverse health effects from ozone exposure than those who spend more time inside or are sedentary (McConnell et al., 2002; Gent et al., 2003).
- Asthma currently affects over 9% of Washington adults (ages 18 and older), and over 110,000 youth in Washington suffer from asthma. The Centers for Disease Control ranks asthma prevalence in Washington State residents as higher than the national average. In 2010, $73 million was spent on hospitalization costs for asthma-related illness in Washington. Asthma is the primary cause of school-age absenteeism nationally and is associated with reduced quality of life, depression, and suicidal ideation (WA DOH, 2013).
- In Oregon, an estimated 10.8% of adults and 7.8% of children have asthma. Oregon has a higher burden of asthma than the overall US and was among the top six states with the highest percentage of adults with asthma in 2011. Children 0-4 years and females have the highest rates of asthma hospitalizations. In 2011, the total cost of asthma hospitalizations was more than $28 million, with an average of over $14,000 per hospitalization (Garland-Forshee & Gedman, 2013).
- The University of Washington's Climate Impacts Group has estimated that ozone levels will rise due to climate change and increases in train, auto, bus, and truck transportation in the state. Ozone levels are expected to increase by 16% in Spokane County and 28% in King County by midcentury (2045-2054) from 1997-2006, increasing the risk for deaths from cardiovascular disease, asthma, and lung cancer. They also estimate an increase in ozone-related deaths by 17% in Spokane County and 27% in King County during the same time period (Jackson et al., 2010).
- Health related costs of current ozone air pollution nationally were an estimated $6.5 billion in 2008 and will continue to rise without change in regulatory controls (Knowlton et al., 2011).

MBT will contribute to negative health impacts of increased extreme weather events and wildfires.

- Extreme weather events with associated injuries are already being witnessed globally. Precipitation extremes including heavy rainfall, flooding, and droughts are projected to increase in all regions of the US (IPCC, 2012).
- Floods account for approximately 98 deaths per year in the US and are the second deadliest of all weather-related hazards (Ashley & Ashley, 2008; NOAA, 2012).
- Steep slopes and intense rainfall can trigger landslides that result in injury and death.

- Smoke from wildfires is associated with cardiopulmonary disease, ischemic heart disease, asthma, bronchitis, pneumonia, cancer and motor vehicle crash injury (Haggerty et al., 2014).

MBT will contribute to negative health impacts of shifting disease ranges.

- Climate change is associated with the spread of vector- and water-borne disease and illness. Vectors such as fleas, ticks, and mosquitoes transmit pathogens that cause diseases including Lyme, dengue fever, West Nile virus, and Rocky Mountain spotted fever.
- Large-scale weather shifts in temperature, precipitation, and humidity can result in vector adaptation or geographic expansion, increasing the number of people at risk for acquiring vector-borne diseases.
- Water-borne illnesses such as pediatric gastrointestinal infections have also been associated with extreme weather events, large-scale flooding, and water source contamination (Luber et al., 2014).

MBT will contribute to loss of food security and increase risk to vulnerable populations.

- An anticipated decline in crop yields, livestock, and fish production from extreme weather, changes in rainfall patterns, and ocean acidification is predicted to raise food prices and result in food shortages.
- Elevated atmospheric carbon dioxide is also associated with decreased plant nitrogen concentration, resulting in decreased protein content of existing plants.
- Mental health disorders and anxiety around climate-related disease and illnesses are an additional concern for health care providers (Luber et al., 2014).
- Air pollution and climate change will continue to disproportionately affect minorities and lower socio-economic populations in Washington, the US and worldwide. Those least responsible for the atmospheric content of carbon and other pollutants are positioned to bear the most significant brunt of their ill effects, including increased respiratory and infectious illness, extreme weather events and food shortages.

The FEIS should include and count the GHG emissions generated by coal extraction. While the technical analysis for GHGs properly includes transportation to and operations at the terminal, as well as some of the impacts of coal combustion, it does not include the GHGs of extraction of coal. It is difficult to see how the extraction of coal for the terminal should be treated any differently than the transportation of that coal to the terminal site. Both are proximately caused by the terminal—the 44 million tons of coal that would be shipped out of the terminal would not be mined but for the terminal, as it would be supplementary to any coal mined used for other purposes.

The FEIS should estimate GHG emissions on the basis of an estimated 50-year lifetime of the project. Specifically, the analysis looks at a time scale of 2018 to 2038, with full operations not occurring (due to a multi-year ramp up) until 2028. (Technical report at 2-13.) In other words, the analysis only assumes that this project will be operating at full capacity for 11 years.

Medical Approach to Climate Change: The Precautionary Principle

The Intergovernmental Panel on Climate Change unequivocally states that a substantial and ongoing reduction in greenhouse gas emissions is necessary to prevent further imbalances in earth's climate and subsequent climate-related disease and illnesses (McCoy & Hoskins, 2014). Many medical professionals and public health advocates, including our organizations, firmly invoke The Precautionary Principle in consideration of proposed coal export projects and this specific proposal by MBT.

The Precautionary Principle – a substantial component of public and environmental health practice – states: "should an activity raise threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relations are not fully established scientifically" (Wingspread Conference, 1998).

The proposed increase in mining, transport, storage, export, and burning of coal externalizes massive long-term threats to human, environmental, and economic health in favor of short-term financial incentives. MBT and other fossil fuel export projects in their totality pose significant risks to the health and livelihood of future generations and the viability of our planet.

B. <u>The DEIS Fails to Disclose the Full Health Risks and Costs to Residents of Washington State and the Region associated with Air Pollution and Diesel Particulate Matter (DPM)</u>

Diesel particulate matter is associated with:

- increased cardiopulmonary mortality and all-cause mortality;
- impaired pulmonary development in adolescents;
- measurable pulmonary inflammation;
- increased severity and frequency of asthma attacks, ER visits, and hospital admissions in children;
- increased rates of myocardial infarction (heart attack) in adults;
- increased risk of ischemic stroke;
- neurodevelopmental and reproductive disorders; and
- cancer.

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 and the Uinta Basin to Longview and back, plus the diesel emissions from the vessels transporting the coal through Columbia River to the Pacific Ocean and back.

Anticipating coal train traffic moving through the Multnomah County to Longview and other locations, the county produced a report in 2013 entitled "The Human Health Effects of Rail Transport of Coal Through Multnomah County, Oregon *A Health Analysis and Recommendations for Further Action."* It states:

> Diesel particulate matter is one of the air toxins that contributes the most to air pollution-related health risks in the Portland region. According to an estimate by the Oregon Department of Environmental Quality, in 2017 the region's airshed will have on average more than ten times the level of diesel particulate that is considered safe.
>
> (See Exhibit: Multnomah County, Oregon Coal Report, 2013)

The effects of air pollution are not hypothetical, but real and measurable. Many studies 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 can 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 huge sources of particulate matter, as they typically produce PM2.5 at a rate about 20-times greater than gasoline engines.

The DEIS discloses significant information about air pollution and diesel particulate matter (DPM):

- 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%,

- 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)

- Table 6-25. Estimated Maximum PM10 and PM2.5 Concentrations—BNSF Main Line in *Eastern Washington*
  Will exceed the 24-hour PM10 and annual PM2.5 ambient air quality standard at 100 feet from the rail line.

- With respect to hazardous air pollutants, the 2005 EPA National-Scale Air Toxics Assessment was used by Ecology to estimate cancer risk (Washington State Department of Ecology 2011). Inhalation cancer risks were highest in the major population centers along the rail route (Vancouver and Spokane), with a cancer risk of up to 500 cancers per million. For the smaller communities (Kelso-Longview, Spokane, Yakima, and Pasco), cancer risks were up to 300 cancers per million.

However, the air quality impact summary in 5.7.5 of the DEIS states "Overall the impacts of PM10 and PM2.5 emissions from proposed-action related rail transport of coal would not be significant because emissions would be below applicable federal standards." This is a misleading statement. While it is true that PM10 and PM2.5 emissions would fall below federal standards, this does not mean that there would be no negative health impacts. In fact, according to the World Health Organization (WHO) "Small particulate pollution have health impacts even at very low concentrations – indeed no threshold has been identified below which no damage to health is observed."[2]

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[2] WHO Fact sheet N°313 - Ambient (outdoor) Air Quality and Health including links and references to: WHO Air Quality Guidelines, Air Pollution and Cancer

Again, human health impacts of particulate matter include cancer, cardiovascular, cerebrovascular and respiratory disease. These health consequences accumulate with increasing exposure. There is a close quantitative correlation between exposure and negative health impacts (morbidity and mortality). Comparing the guidelines used in the DEIS (which are from the U.S. National Ambient Air Quality Standards and Washington State Air Quality standards) against the WHO guidelines, we find that the WHO guidelines are lower and more restrictive. In some cases (particularly PM10), they are considerably lower. The following table compares WHO guidelines with NAAQS:

WHO Particulate Matter Exposure Guideline values[3] with NAAQS/Washington State Standards shown in parentheses for comparison

$PM_{2.5}$
Annual mean - 10 $\mu g/m^3$ -- (NAAQS 12 $\mu g/m^3$)
24-hour mean - 25 $\mu g/m^3$ -- (NAAQS 35 $\mu g/m^3$)

PM_{10}
Annual mean - 20 $\mu g/m^3$ (Not included in the DEIS)
24-hour mean - 50 $\mu g/m^3$ -- (NAAQS 150 $\mu g/m^3$)

Below are examples of expected emissions from project operations with comparison to WHO Air Quality Guidelines:

Table 5.6-6. Maximum Modeled Concentrations from the Operation of the Coal Export Terminal shows total predicted concentrations of PM10 (24 hour average) of 80mcg/m3. This exceeds the WHO guideline of 50mcg/m3.

Table 5.6-7. Project Area Concentration from Operations (All Sources) shows total predicted concentrations of PM2.5 (24 hour average) of 29.8mcg/m3. While under the NAAQS 35mcg/m3 threshold is over the WHO standard of 25mcg/m3.
Total predicted concentrations of PM10 (24-hour average) would be 108mcg/m3, which is over twice the WHO threshold of 50mcg/m3.

Table 5.7-6. Estimated Maximum PM10 and PM2.5 Concentrations—BNSF Main Line, Cowlitz County shows the total concentration of PM10 at 50ft and 100ft to be 58mcg/m3 and 51mcg/m3 respectively, both of which exceed the WHO guideline of 50mcg/m3.

IARC's 2013 Assessment, Review of Evidence on the Health Aspects of Air Pollution (REVIHAAP) - http://www.who.int/mediacentre/factsheets/fs313/en/

[3] WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide Global update 2005 - http://apps.who.int/iris/bitstream/10665/69477/1/WHO_SDE_PHE_OEH_06.02_eng.pdf

The 24-hour average of PM2.5 at 50 feet is 25.5mcg/m3 which is above the WHO guideline of 25mcg/m3, while at 100 feet it is 24.8, just below the WHO standard.

Table 5.7-9. Estimated Maximum PM10 and PM2.5 Concentrations 100 Feet From Rail Line— BNSF Main Line, Washington State (Outside Cowlitz County) shows the total concentration of PM2.5 (annual average) to be 9.8mcg/m3, which is just under the WHO guideline of 10mcg/m3.

The 24-hour average of PM2.5 is 27mcg/m3, which exceeds the WHO guideline of 25mcg/m3.

The PM10 (24-hour average) is 125mcg/m3, which is two and a half times the WHO guideline of 50mcg/m3.

Of particular interest is Table 5.7-9, which demonstrates that the current baseline PM10 (24-hour average) is 101mcg/m3 is already twice the level established by the WHO. This is important in light of data summarized in the WHO Air Quality Guidelines and statements that "reducing *annual* average particulate matter (PM_{10}) concentrations from levels of 70 $\mu g/m^3$, common in many developing cities, to the WHO guideline level of 20 $\mu g/m^3$, could reduce air pollution-related deaths by around 15%. However, even in the European Union, where PM concentrations in many cities do comply with Guideline levels, it is estimated that average life expectancy is 8.6 months lower than it would otherwise be, due to PM exposures from human sources." [4] [5] [6] [7] (Note that the above numbers refer to *annual* PM10 concentrations which were not measured/modeled/included in this DEIS.)

Though particulate matter and coal dust emissions from the Millennium Bulk Terminal Project are expected to fall under NAAQS and Washington State Standards, they will have negative health impacts. The DEIS identified places in Washington State, especially near the railroad tracks, where current air quality is already unacceptably poor, exceeding WHO guidelines by two times in at least one case.

Improvements in ambient air quality in these locations can be expected to have considerable positive health impacts, while the effect of MBT would be, in all instances, to increase exposure to particulate matter, which has negative health impacts even at very low doses.

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[4] Pope CA et al. (1995). Particulate air pollution as a predictor of mortality in a prospective study of U.S. adults. American Journal of Respiratory and Critical Care Medicine, 151:669–674.

[5] Pope CA et al. (2002). Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. Journal of the American Medical Association, 287:1132– 1141.

[6] Cohen A et al. (2004). Mortality impacts of urban air pollution. In: Ezzati M et al., eds. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. Geneva, World Health Organization:1353–1434

[7] Dockery DW et al. (1993). An association between air pollution and mortality in six U.S. cities. New England Journal of Medicine, 329:1753–1759.

We object to DEIS air quality assessments based on modeling with insufficient actual monitoring. In Section 5.6.4.2, the following statement appears:

> The only available local (Cowlitz county near project site) air pollutant monitoring is for PM2.5, at a station approximately 1.5 miles east of the project area. The monitoring data show that PM2.5 levels are well within the PM2.5 air quality standards. Although no other monitoring data are available, concentrations of other criteria air pollutants in the study area also are expected to be well within air quality standards.

The City of Portland and Oregon Department of Environmental Quality recently discovered the risk of underestimating air pollution when air quality modeling is based on a small number of actual monitoring stations. The U.S. Forest Service used moss bio-indicators as a novel air quality monitoring strategy and found very high levels of cadmium (49 times higher than Oregon air quality standards) near several stained glass manufacturers.[8] These very high toxic emissions were not predicted based on prior, inadequate air quality monitoring. The data from only a few stations was available and assumptions in modeling led to significant errors. The DEIS assumption that "concentration of other criteria air pollutants in the study area also are expected to be well within air quality standards" does not rise to the level of rigor one must have when working to protect public health and the health of workers at the terminal.

1. The DEIS Understates the Health Impacts and Risks of DPM on 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 co-morbidities such as smoking (Bofetta, 2001). The impact of DPM on cancer risk must be considered in the decision making process for the MBTL.

2. The DEIS Understates the Health Impacts and Risks of DPM on Cardiac and Pulmonary Disease

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

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[8] Donovan, Geoffrey H, et al. 2016. Using an epiphytic moss to identify previously unknown sources of atmospheric cadmium pollution. Science of The Total Environment. 559: 84-93

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 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 one hour. Additional work utilizing controlled diesel exhaust exposures to human volunteers has revealed that these acute exposures result in an impairment in blood vessel function and alter 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 have been investigated. Research published in the

Archives of Internal Medicine (2012) (See References: DPM) 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. (See References: DPM at end of this document.) 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.

3. The DEIS Fails to Disclose the Impacts of DPM on Reproductive and Neurodevelopmental Disorders

A review of peer-reviewed journal articles makes evident concerns about impacts of DPM on reproductive and neurodevelopmental disorders:

- Reduced sperm quality in men exposed to air pollution, particularly diesel exhaust (De Rosa et al., 2003)
- Disruption of normal sexual differentiation during fetal development, including 2.42% higher odds of male cryptorchidism (undescended testes) amongst babies of fathers exposed to diesel exhaust before conception (Kurahashi et al., 2005)
- Increased congenital heart, lung, and immune system anomalies in children (Gauderman et al., 2004; Vrijheid et al., 2011)
- A 10 microgram increase in DPM (2.5) is associated with a 3.4% increase risk in daily mortality (Laden et al., 2000)
- In 2005 the World Health Organization published a summary of the health risks of air pollution on childhood health and concluded that "sound evidence already exists for a causal link between air pollution and children's health" (WHO, 2005, p.7)
- In the same document the WHO recommended that policy makers take measures to reduce childhood exposure to air pollution (WHO, 2005)

We 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. 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.

Diesel components, 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 mile-and-a-third-long trains (8 trains 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, as well as coal dust.

Exposure to toxins in airborne particulate matter from diesel engines and coal dust 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, added air toxins from increased trains transporting coal would be a certainty, with well-studied human health effects.

4. The DEIS Understates the Health Impacts and Risks of DPM and 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 should be studied 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 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 (PAH) 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.

C. <u>The DEIS Fails to Disclose the Health Risks and Costs to Residents of Washington State and the Region of Additional Toxic Air Pollutants</u>

The DEIS understates the toxic impacts of coal dust. The DEIS states, "One review of the chemical composition of coal dust (U.S. Geological Survey 2007) suggests that the risk of exposure to concentrations in toxic materials (e.g., PAHs and trace metals) from coal are low because the concentrations are low and the chemicals bound to coal and not easily leached." The DEIS fails to address other studies identifying risks from toxic materials in coal dust. Co-leads should evaluate the expert report prepared by Leyda Consulting, Inc., on the proposed Morrow Pacific coal export project (hereafter "Leyda EXHIBIT").[9] The Leyda EXHIBIT includes an in-depth toxicology report on coal dust.

It should be emphasized that children are not "little adults" and are thus more vulnerable to the health effects of environmental contaminants. Children eat more, breathe 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 are more vulnerable to adverse effects.

Toxic Air Pollutants (TAPS) of concern that may be emitted by this project include arsenic, cadmium and mercury. We request that the Washington Department of Ecology conduct independent health risk assessments for all TAPS that may be emitted by this project.

1. The DEIS fails to fully disclose health impacts of exposure to arsenic.

The DEIS states that arsenic is one of the pollutants that would continue to be introduced as a result of the proposed action in Longview and along the tracks. While the DEIS states that maximum concentrations of arsenic will be lower than acceptable source impact levels, recent studies published in journals such as Environmental Health Perspectives suggest that arsenic is harmful to human health at lower levels than previously thought (Carlin et al., 2016; Naujokas et al., 2013), including increased risk for skin and lung cancer. (Bailey et al., 2016)

"Inhalation exposures to arsenic–bearing dusts and aerosol, in both occupational and environmental settings, have been definitively linked to increased systemic uptake, as well as carcinogenic and non-carcinogenic health outcomes." (Martin et al., 2014)

Low levels of exposure to arsenic are particularly worrisome for pregnant women and children. Recent studies show that exposure to arsenic in the womb and in early childhood may cause decreased fetal growth and adverse epigenetic effects. (Naujokas et al., 2013; Flora, 2011; Bailey et al., 2016)

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[9] Leyda Consulting, Inc., *Ecological Impacts of Proposed Coal Shipping on the Columbia River Port of Morrow and Port Westward, OR* (2012).

The risk of exposure to arsenic and its toxicity is further supported by the CDC's Agency for Toxic Substances and Disease Registry: arsenic has been ranked Number 1 on that agency's Substance Priority List since 1997, and before that it was second only to lead. (ATSDR 2007)

Government standards for allowable levels of arsenic in water have already been lowered by 80% in the last 16 years as evidence has grown demonstrating toxicity at lower levels of exposure. (USEPA Chemical Contaminant Rules) This evidence will likely continue to grow. Changing standards remind us that, though certain current standards may be met, these standards may not and, at times, do not adequately protect human health.

2. The DEIS fails to adequately disclose health impacts of exposure to cadmium.

Cadmium is a highly toxic metal with a very long half-life of 20-30 years in humans and accumulates in soft tissues, kidneys, and the liver. Specific mechanisms of cadmium toxicity are not well understood; however, evidence suggests that cadmium affects DNA repair, and cell signaling and control. These effects lead to kidney damage, cancer, mutations, damage to hormone regulating mechanisms, reproductive disorders, and problems with cellular differentiation (Rani et al., 2014). Some evidence also points to harmful long-term and heritable effects of cadmium (Ray et al., 2014). In humans, cadmium disrupts biologic pathways involving calcium, leading to bone and muscle issues (Choong et al., 2014).

The International Agency for Research on Cancer (IARC) classifies cadmium and cadmium compounds as carcinogenic to humans (Group 1) (IARC, 2012). Group 1 classification is the strongest assertion of carcinogenicity.

Recent studies have linked cadmium with bladder cancer (Feki-Tounsi et al., 2014). Evidence also exists for associations with breast cancer (Dematteo et al., 2013) and pancreatic cancer (Wei Qu et al., 2012; Garcia-Esquinas et al., 2014). A recent review found that "exposure to low concentrations of Cd is associated with effects on bone, including increased risk of osteoporosis and fractures…" (Akesson et al., 2014).

Cadmium was implicated in Itai Itai disease due to industrially contaminated water in people exposed (especially women). They suffered osteomalacia and osteopenia, decreased bone mineral content, and decreased bone density (Kobayashi, 1971; Kasuya, 2000; Inaba et al., 2005).

In a retrospective study of over 2,000 children, the authors concluded that children who have higher urinary cadmium concentrations may have increased risk of both [acquiring] LD [learning disability] and [being more likely to receive] special education. These associations were found at exposure levels that were previously

considered to be without adverse effects, and these levels are common among U.S. children (Ciesielski et al., 2012).

In a prospective study of 270 children, the authors "noted in boys a 1.53 times higher risk for emotional problems with a twofold increase in cord blood cadmium" (Sioen et al., 2013).

In a prospective study of over 1000 children, the authors concluded: "Early-life low-level cadmium exposure was associated with lower child intelligence scores in our study cohort" (Kippler et al., 2012).

Cadmium mimics estrogen (Johnson, MD, 2003) so it is an endocrine disrupting chemical. It also affects male reproduction in animal studies, and has recently been implicated in human epidemiological studies as causing decreased birth weight. (Johnston et al., 2014; Kippler et al., 2012).

A recent study showed that cadmium exposure was related to leukocyte telomere length (a marker of cellular aging). The authors concluded: "These findings provide further evidence of physiological impacts of cadmium at environmental levels and might provide insight into biological pathways underlying cadmium toxicity and chronic disease risk" (Zota et al., 2014).

3. The DEIS fails to adequately disclose health impacts of exposure to lead.

Stanford University produced a fact sheet on lead that demonstrates that the inhalation or ingestion of lead-containing particles can result in "lead poisoning" which has been associated with a number of short term (acute) and long term (chronic) adverse health effects. Depending on the amount of exposure (dose) immediate symptoms may not always be apparent or may resemble other illnesses and result in misdiagnoses.[10]

Acute, short term health effects may include: cramps (lead colic), irritability and moodiness, headaches, insomnia, tiredness, nausea, loss of libido, birth defects, miscarriage, stillbirth, constipation, and, in children, hyperactivity, lower IQ, slowed growth, and hearing loss. Chronic, long term health effects may include: muscle and joint soreness, fine tremors, numbness, hypertension, anemia, infertility, and kidney damage.

Lead can stay in the body for years and is stored in bone or soft tissue including the liver and kidneys. During periods of high calcium demand such as pregnancy, menopause and aging, lead stored in bone tissue can be released back into the

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[10] https://web.stanford.edu/dept/EHS/prod/general/asbestoslead/leadfactsheet.html

bloodstream. Lead is also able to cross the placenta and blood/brain barrier.

Exposure to lead can occur almost anywhere. Studies have shown that lead dust can be carried on coveralls or other work clothing resulting in contamination of worker's cars, homes and family.

There is lead in coal dust. There is no safe level of lead. Lead dust is 100% absorbed when inhaled by infants. Lead causes neurodevelopmental disorders. It can cause severe toxic effects in children in multiple organs and widespread disruption of cellular functioning. It damages the bone marrow and nervous system with direct nerve cell damage harming brain development, which in turn causes seizures, schizophrenia, cognitive loss, and many serious sequelae, including academic failure.

There is no good treatment for lead poisoning. Chelation therapy is difficult and does not reverse cognitive impairment. As in Flint, Michigan, lead poisoning is usually identified after the fact, when the harm has already been done.

What will be the cumulative levels of lead deposited in air and in soil in Longview and along coal train tracks? We must answer questions like this now, before 44 million tons of coal, and its associated burden of lead, is brought in uncovered rail cars through Washington and the region each year and is stored, in uncovered piles, in Longview.

4. *The DEIS fails to adequately disclose health impacts of exposure to mercury.*

According to the City of Portland's June 9, 2016 MBT DEIS comments: "…In the Columbia River Basin more than 80 percent of the mercury pollution is from overseas sources." A peer-reviewed 2008 study [11] found that coal-fired power plants in Asia contribute 18% of springtime mercury concentrations at Mount Bachelor.

Snowpack melts into our rivers and lakes where mercury contaminates the fish we eat. Pregnant women and children are particularly vulnerable to the toxic effects of mercury. Mercury is a potent neurotoxin that can damage developing brains in fetuses and children.

Dr. Martha Neuringer, a renowned biomedical researcher at Oregon Health Sciences University, stated in testimony she presented to the Portland City Council in September 2012,

> The effects of coal-derived mercury on infant brain development are well known. Coal-derived mercury has significant negative impacts on the visual system, on motor development, and on cognitive development. It insidiously limits human potential. A massive increase in coal traffic through our region would greatly increase the mercury burden in our

[11] http://www.atmos.washington.edu/jaffegroup/publications/Pacific_Transport_Hg.pdf

environment and therefore the damage to our children. This is a moral issue, but can also be reduced to its economic impacts.

The effects of mercury from coal on reduced intellectual development - on this one health effect - are estimated to cost $3 billion per year in the U.S.[11] This is just one part of the overall health costs of $10-30 billion, which in turn is just part of the estimated total externalities – environmental, economic and health effects of coal -- which total half a trillion dollars per year.[12]

Coal export projects would have a reverberating impact in our region, as coal dust increases mercury and many other toxins in our air and our water; and then, when it is burned in China, as the prevailing winds bring air-borne toxins back to us…

To preserve the health and human potential of our children, I urge you to oppose Northwest coal export projects in any way possible.

What does the DEIS disclose about mercury?

- Mercury is one of four primary contaminants found in the broader Columbia River basin.
- Trace elements of environmental concern (TEEC) in Powder River and Uinta Basin coal include mercury.
- All scenarios show an increase in mercury deposition by 2040.

In Appendix I, the DEIS estimates mercury deposition resulting from coal burning in Asia. It estimates the maximum contribution from the coal exported from the MBT terminal would be less than 0.3%. We believe that this estimate is too low, because Asian mercury emissions were estimated to contribute between 5-36% of total mercury deposition on the US (p. I-6). Mt. Bachelor mercury levels from Asian emissions were 18% and 14% (p. I-7) and the Asian Hg^{II} is largest at low latitudes (where most people in Washington live). We must not overlook or minimize the fact that mercury would keep blowing back to Washington residents and others as long as the coal is burned, replenishing the supply of dangerous forms of mercury.

The DEIS should disclose by what percentage Asian Hg emissions will increase under the proposal. These numbers are not provided in Appendix I, which instead gives estimates of Hg deposition here. Again, we believe these estimates are low.

A direct result of the MBT will be a substantial increase in airborne pollutant emissions from train and marine traffic from the Powder River Basin and the Uinta Basin, all through the rail transportation corridor, at the terminal site, and on and near

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[12] Epstein PR et al. Full cost accounting for the life cycle of coal. Annals of the New York Academy of Sciences, vol 1219, pp 73-98, 2011.

the Columbia River. If MBT is not built, these significant increases in negative impacts will not occur.

D. The DEIS understates the health risks and costs to human health from 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).

In addition, recent data from Australia underscores our concern that "real world" measurements do a substantially better job predicting what will happen than the models used in the DEIS. In a recent study in Australia, monitors showed dramatic spikes—including spikes that exceed levels set to protect human health and safety—when uncovered coal cars passed by. One particularly startling finding of this study was that empty coal trains had higher particulate pollution than loaded ones. (See MBT DEIS comments and exhibit from Columbia Riverkeeper *et al*.) However, the DEIS dismisses pollution concerns from empty cars, an omission that must be rectified in the FEIS.

A significant article from Dr. Dan Jaffe et al., from University of Washington in 2015 quantifies emissions from diesel engines and coal dust from unit trains that travelled through the Columbia River Gorge.[13]

Furthermore, Dr. Jaffe, Professor of Atmospheric Chemistry at University of Washington, submitted comments in June on the DEIS after reviewing Chapter 5.7: Coal Dust. He states:

- The DEIS describes an "acceptable level of dust deposition" in terms of g/m2/month. However, nowhere does the document describe an acceptable level of human health impacts. Our data demonstrates short-term PM2.5

13 http://www.atmos.washington.edu/jaffegroup/modules/APOLLO/Jaffe_DPM_coal_dust_trains_ColumbiaRivGorge_2015.pdf

concentrations of up to 232 ug/m3 due to coal trains. These exposures were documented on private property adjacent to rail lines in the Columbia River Gorge (Jaffe et al 2015). This was due to a large, clearly visible cloud of coal dust. While the health effects of such short-term exposure have not been extensively studied, some peer-reviewed published scientific papers have documented significant health effects from short-term exposure to PM2.5 (Salvi et al., 1999; Pope et al., 2015; Li et al., 2016).

- The DEIS seems to imply that coal dust does not contribute to inhalable particulate matter that contributes to human health problems (eg PM2.5). This is clearly not the case. To quote from the DEIS Coal Dust fact sheet: "The study found that coal dust particles from rail cars are typically large and fall close to the rail tracks." Our data, and the Cowlitz County data, clearly indicate that coal dust constitutes a range of particle sizes including particles smaller than 2.5 micrometers in diameter. The EIS needs to clearly indicate that coal dust includes inhalable PM2.5.

- The DEIS reports on one study down in Cowlitz County (pg 5.7-5 main document and 2.2-4 in technical supplement). There are a number of problems associated with this study. First, this study was likely influenced by an inherent bias due to the fact that the shipper knew the date, time and location of the tests. They can then utilize their best operating conditions to minimize diesel, coal dust and other PM impacts. This is not the same as a "blind" test, whereby the shipper is not notified of the date and location of the testing. In particular, a "blind" test will identify the true failure rate for the surfactant and true coal dust emissions, whereas the biased test will not identify the true failure rate. This study apparently never saw a coal train with a PM2.5 concentration greater than 22 ug/m3 (Figure 4), whereas we identified coal trains with large dust plumes and much higher PM2.5 concentrations of up to 232 ug/m3. This is likely due to the fact that the shipper was aware of the testing that was taking place.

Despite this point,

> the data from the Cowlitz study clearly show that the dust suppression methods are much less than 100% effective. This is because the observed concentrations are 4 times higher than the modeled concentrations, as shown in Figure 4 of the SEPA Coal Technical Report. Models are useful to estimate many environmental situations, but they must be constrained and confirmed by observations. In this case, the model is clearly not reproducing the observed concentrations. This can only be explained if the modeled coal dust emissions are much larger than what is being put into this model. The Cowlitz County data, shown in Figure 4, indicate that the model is under-estimating the coal dust emissions by about a factor of four. This would imply that the actual coal dust emissions are four times greater than the modeled emissions. The DEIS cites a dust suppression effectiveness of 61%, whereas the data indicate an effectiveness of only 25%. Section 2 in the technical document ends with Figure 4 and does not discuss the implications of this large discrepancy between the model and observations. It is absolutely essential that the modeling be redone with the significantly higher, and correct, coal dust emissions. Based on both the UW and Cowlitz County studies, the data show much higher dust emissions than are accounted for by the modeling.

- Based on these results, the modeling should be redone using two different approaches: First, the model should assume that 5% of the coal trains had no surfactant (equivalent to saying that the surfactant was incorrectly applied or otherwise ineffective). The model results should then be re-evaluated based on this assumed failure rate. Second, the modeling should be redone with a coal dust emission factor that is four times larger. This would be consistent with the Cowlitz County data presented in Figure 4 of the SEPA Coal Technical Report. This is particularly important given that the trigger level for impacts (2 g/m2/day) are already exceeded for some receptor location (Table 5.7-7) or very close to the currently model estimates (1.88 g/m2/day, Table 5.7-3) and that human health impacts from short term exposure to high concentrations have been documented.

- Our peer-reviewed and published scientific analysis (Jaffe et al., 2015) clearly indicates that the surfactant coating does not always work. At present there is no information on the cause of these failures. As such, it is impossible to know if additional coating facility (e.g. requiring a facility in Pasco) will

significantly reduce coal dust emissions. The EIS needs to address what are the causes for failure in the surfactant coating.

- The coal dust modeling (Table 5.7.2) fails to incorporate any failure rate into the calculations. Our data show that the failure rate for moving trains is at least 5%. The contribution from these coal trains where the surfactant has been misapplied (or not applied at all) likely dwarf the emissions from all other trains.

1. Health Impacts of Coal Dust and 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, 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).

2. Health Impacts of Airborne Coal Dust

The DEIS acknowledges that so much dust is produced by coal trains that it creates a safety hazard by destabilizing rail road ballast (DEIS 5.7-15). The point is well taken, as coal dust accumulation in railroad ballast has been documented as a factor in derailments, and BNSF has recently undertaken significant efforts to remove coal dust near the the Columbia River and elsewhere. However, the DEIS does not acknowledge the huge inconsistency between its modeled conclusions of "insignificant" dust deposition with the known experience that so much coal dust is escaping that it is destabilizing rail infrastructure.

Another point that demonstrates that the DEIS model-based approach is inconsistent with known experience is hidden in the technical report itself. Figure 4 of

the coal dust technical report compares the "modeled" emissions of coal dust with the actual emissions as measured during the October 2014 test. As Dr. Dan Jaffe has pointed out in his independent comments, actual emissions are four times higher than the modeled emissions. Even so, the DEIS conclusions are all based on the modeled emissions, likely understating the dust impacts by a considerable degree. This must be corrected in the FEIS.

Coal dust is associated with:

- Chronic bronchitis;
- Emphysema;
- Pulmonary fibrosis (pneumoconiosis); and
- Environmental contamination through the leaching of toxic heavy metals.

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).

What does the MBT DEIS disclose about air pollution and coal dust?

- Table 6-21 shows violations of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM2.5) from coal dust in Cowlitz County.

- "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.)

- "The average and maximum deposition of coal dust on the BNSF main line in Cowlitz County was estimated to be above the nuisance thresholds at 50 and 100 feet, and because no state or federal standards apply, this an unavoidable but not significant impact." (Chap. 5 at 5.7-25.)

- Table 6-22. Estimated Average Maximum and Maximum Monthly Coal Dust Deposition—BNSF Main Line *in Cowlitz County* PM 2.5 and PM 10 are expected to exceed NAAQS.

- Table 6-24. Estimated Average Maximum and Maximum Monthly Coal Dust Deposition—BNSF Main Line *in Columbia River Gorge* Average maximum and maximum monthly coal dust deposition for Columbia Gorge would be exceeded. (Chap. 6 at 6-69.)

- Table 6-26. Estimated Average Maximum and Maximum Monthly Coal Dust Deposition—BNSF Main Line in *Eastern Washington.* The estimated average maximum monthly coal dust deposition is above the trigger level at 100 feet from the rail line.

- Toxic constituents of coal include polycyclic aromatic hydrocarbons (PAHs) and trace metals, which are present in coal in variable amounts and combinations dependent on the type of coal. (DEIS p. 4.8-23)

- The concentration of PAHs in Powder River Basin coal was not investigated. (DEIS. 4.5-26)

- Seventy percent of the Cowlitz County air toxic cancer risk is due to just three air toxics: PAHs, formaldehyde, and benzene. (DEIS p.5.7-16)

Note that Table 5.7-3 (Estimated Maximum Annual and Monthly Coal Dust Deposition) utilizes a trigger level for sensitive areas based on a New Zealand Ministry of the Environment level for nuisance dust. This is not a health based measure. This is a misleading comparison in that it serves to minimize impact of the coal dust deposition for the study area by comparison with a non-health based number.

The Health Department in Multnomah County, Oregon analyzed potential health impacts to County residents from coal train transportation only. The analysis

> drew upon the available literature to estimate that coal dust may travel approximately 500 m to 2 km (1/3 to 1 1⁄4 miles) from the train tracks, depending on weather conditions and train speed.[57,58] Census tracts—relatively small geographic areas used for census-taking—offer a rough

> proxy for the 2 km distance from the rail line. Using this approximation allowed the Health Department to utilize Census Bureau data to describe potentially affected populations. Almost one-third of Multnomah County's population lives in census tracts that either border or cross rail lines that may carry coal…Many of these people live near major roadways and industrial areas and probably already experience a high burden of air pollution and noise disturbance. Accordingly, the potential burdens of the coal export projects would fall on the same populations who are already exposed to the highest levels of air toxins and industrial noise. (See EXHIBIT: Multnomah County Coal Report, 2013.)

The FEIS should also consider evidence from Australia, which has had a long history of large coal-export terminals with open coal stockpiles and extensive experience with the pollution that they cause. One analysis for a new terminal in Newcastle, performed as part of the project's license, shows that it would discharge over 300,000 kg/year of coal dust at operations of 66 million ton/year. The analysis breaks down the emissions rate for each stage of the process. The largest source of emissions is from wind erosion of stockpiles. Another analysis, based on data from Australia's National Pollutant Inventory [14]--that nation's most authoritative data source for pollutant information—shows that coal terminals were the primary sources of particulate air pollution in two areas where major coal terminals operated.

The Hay Point coal terminal in MacKay self-reported a release of 160,000 kg of PM10 and 17,000 kg of PM2.5 in 2014-15. A news report from April of this year reported that the three coal export terminals in Newcastle were responsible for 62% of that city's PM10 air pollution.[15] These authoritative figures collide sharply with the DEIS's modeled emissions—which anticipated releases an order of magnitude lower, using the exact same approaches to reduce dust from open stockpiles. Clearly, the real-world experience in Australia has more to offer than the flawed models of the DEIS.

The MBT DEIS contains recommended mitigation measures, many of which are unenforceable and speculative. For example, to address the impacts of coal dust from trains, the DEIS states: "BNSF should conduct a dust monitoring study along BNSF main line in Cowlitz County to evaluate coal dust emissions from coal trains, and if necessary, take further actions to reduce such emissions." However, BNSF is not applying for any permits for the Millennium project.

No meaningful attempt is made on the part of the applicant to prevent exposures resulting from its projected activities. For example, MBT could enclose the predicted 85-foot high piles of coal at the terminal. Ambre Energy proposed such a plan for the Morrow Pacific project in Boardman, Oregon. But MBT has no intention to do so. It can therefore be predicted that adverse health impacts will result from the MBT project.

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[14] http://www.npi.gov.au/

[15] http://www.smh.com.au/environment/air-pollution-increases-69-per-cent-as-coal-named-top-polluter-20160417-go8b82.html

Mitigation measures to address coal dust near the terminal include creating a system for people to report coal dust complaints. (DEIS Coal Dust Fact Sheet at 4.) This is unacceptable. Reporting will not reverse the negative health impacts already experienced and the health care costs already incurred.

The only mitigation for coal particulate pollution - a health hazard, an environmental issue, and a nuisance - is to eliminate the pollution.

E. The DEIS fails to disclose potential health risks and costs to human health from exposure to surfactants.

The 2013 Multnomah County coal study states:

> The company states that the proper application of certain topper agents along with the use of a modified loading chute can potentially reduce coal dust levels by at least 85 percent. However, there is no evidence of independent verification of these findings. In a series of cases before the federal Surface Transportation Board, utility companies that are required to follow BNSF Railway's rules for shipping coal have argued that there is insufficient evidence for the effectiveness of these substances and that shippers should not be responsible for the costs of applying them.[38–41]

BNSF requires the use of these chemical agents by companies shipping coal from mines. Given that they are used at the mine and it has been found that they need to be reapplied along the route (e.g., at Pasco), then what is the fate of these surfactants or dust suppressants in Longview and along the transportation route (from the Powder River Basin and the Uinta Basin to Longview, and back)?

Six topper agents have been approved for use on rail cars shipping coal on BNSF railroads. (See BNSF Rules and Other Governing Provisions, Appendix B, BNSF 6041-B, Page 19, September 2011) These topper agents have been tested for effectiveness in dust suppression. But information is not given in the DEIS on their fate and transport or toxicity in the environment. If they are washed off by rain or through fire suppression efforts or lost with blowing coal dust (while losing efficacy in time along the route), what is their impact on ground and surface water, on plants and animals that may be exposed to them, or to humans who may be exposed by ingestion, inhalation, or dermal absorption of these chemical compounds?

While dust suppressants are available for use, little or no information is available on their chemical make-up or toxicity to human health or the environment. The DEIS must identify all components of dust suppressants or "topper agents" in order to determine whether there is risk associated with their use.

F. The DEIS understates the health risks and costs to human health from 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 sleep disturbance, cognitive impairment, cardiovascular disease, including increased blood pressure, arrhythmia; stroke and ischemic heart disease, increased rate of accidents and injuries, hearing loss, and exacerbation of mental health disorders.

Coal trains produce significantly greater noise and vibration than other trains. Longer trains mean 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, simply based on the noise and vibration they experience.

Noise and vibrational effects from rail traffic vary from idling, rumbling, screeching, and horn sounding. Horn sounding poses the most significant to risk to human health. The U.S. Department of Transportation's "Train Horn Rule" (49 CFR Part 222) requires engineers to sound train horns at 96 to 110 decibels (dB) fifteen to twenty seconds in advance of all public grade crossings (US DOT, 2005). The World Health Organization's "Guidelines on Community Noise" (1999) state that sleep disturbances and risk of adverse health effects of noise have been observed at 45 dB or less, recommending that noise events exceeding 45 dB be "limited if possible" (p. 8).

Like many of the previously listed health concerns, the noise of coal trains could represent an increase to an existing health problem. A person awakened from sleep every hour -- as would be expected when the MBT is at full operation -- would experience a different order of magnitude of adverse health impacts than a person awakened or otherwise disturbed once or twice a night from existing train traffic. The train traffic associated with MBT will directly impact multiple dense residential areas along the entire rail line in several states.

According to Washington noise standards, the maximum permissible levels for Class A (residential) are 55 dBA in the nighttime and 45 dBA at night. These are not averages. The DEIS relies too heavily upon averages. Even so, it discloses that approximately 60 residences in Longview would be exposed to severe noise impacts with coal trains. It also states that "absent the creation of a Quiet Zone, the potential adverse indirect noise impacts during rail operations along the Reynolds Lead would result in a disproportionately high and adverse effect on minority and low income populations. This potential disproportionately high and adverse effect would affect a total of approximately 289 residences located in Census Tract 3 Block Group 1, Census Tract 5.02 Block Group 1, and Census Tract 5.02 Block Group 2, all of which have been identified as minority communities (see Table 18)." (DEIS at 3-13)

Hundreds of thousands of other people along multiple transportation routes will likely experience severe noise impacts and sleep disruption multiple times through the night as a direct result of MBT. The FEIS should disclose these impacts to other communities, including environmental justice communities away from the project site.

1. The DEIS Fails to Adequately Disclose Impacts of Noise on Sleep Disturbance

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 (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).

The health implications of chronic and nocturnal noise from increased rail traffic are highly likely and will impact human health in multiple areas and all age ranges (Goines & Hagler, 2007; Babisch, 2005).

A case-control experimental study found that train transportation noise and subsequent vibrations led to a significant acceleration of heart rate of at least 3 beats per minute in 79% of sleeping participants after experiencing high-vibration periods produced from trains passing. These nocturnal heart rate accelerations are believed to potentially affect long-term cardiovascular health for populations living in close proximity to railroads with frequent rail traffic (Croy et al., 2013).

Despite public safety mitigation in some urban areas where quiet zones have been established (at great expense to taxpayers), a growing body of research demonstrates that continuous noise, as well as sudden intermittent nocturnal noise and vibrations, result in sleep disturbances and can cause impaired cognitive function and cardiovascular effects.

2. The DEIS Fails to Adequately Disclose Impacts of Noise on 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.

Specifically, the elevation of stress hormones such as epinephrine and cortisol resulting from high decibel noise exposure increases endogenous risk factors of heart disease from both short-term and chronic exposures (Ising & Kruppa, 2004; Selander et al., 2009; Sørensen et al., 2011; Sørensen et al., 2012).

Sleep disturbance resulting in fatigue increases risk of hypertension, arrhythmia, and risk of accidental injury. Recent epidemiological studies support previous evidence that night-time noise and noise in excess of 90 decibels are associated with cardiovascular disease including risk of acute coronary events, myocardial infarction, arrhythmia, accelerated hypertension, and stroke (Hume et al., 2012),

3. The DEIS Fails to Adequately Disclose Impacts of Noise on 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 et al., 2005).

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).

The health implications of chronic and nocturnal noise from increased rail traffic are highly likely and will impact human health in multiple areas and all age ranges (Goines & Hagler, 2007; Babisch, 2005).

4. The DEIS Fails to Adequately Disclose Impacts of Noise on Mental Health

Another less well appreciated risk of high decibel rail noise and vibration exposure is the impact on mental health. 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 et al., 1995; Fidell S et al., 1991; Haines MM et al., 2001; Haines MM et al. #2, 2001).

Elevated noise is associated with cognitive impairment in children, as well as exacerbation of mental health disorders including depression and anxiety (Lercher, et al., 2003; Haines et al., 2001; Hygge et al., 2002).

G. <u>The DEIS understates the risks and costs of delayed emergency response times from increased frequency of long trains and delays at at-grade crossings.</u>

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. We request a comprehensive HIA that discloses related risks and costs along the entire rail corridor as part of the FEIS.

For many of our most common acute health issues, such as stroke, heart attack, massive hemorrhage, and trauma, every second counts. 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.

There are many 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. In many cases, an ambulance must cross a set of 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.

The DEIS discloses many of these challenging rail traffic impacts that could delay emergency response times:

- "Trains related to the Proposed Action could affect accessibility to community resources and public services during peak travel times because of increasing wait times at grade crossings along the Reynolds Lead, BNSF Spur, and BNSF main rail line." (Summary at S-12)

- "Trains related to the Proposed Action would also increase emergency vehicle delay at rail crossings. The total gate downtime would increase over 130 minutes a day at crossings along the Reynolds Lead and BNSF Spur, and up to 20 minutes a day at the study crossings along the BNSF main line." (Summary at S-32)

- Table 6-6 shows every segment on the rail system greatly over capacity if all proposed projects, including coal and oil, are built.

- Table 6-7 shows a significant increase in train accidents (this

analysis includes oil trains).

- Table 6-9 shows unacceptable level of service at multiple rail crossings due to delays from cumulative projects.

- The probability of an increase in emergency response time at all at-grade crossings would also increase because at-grade crossings would be blocked more frequently.

- 16 coal trains each day in Longview will result in over two hours of additional rail gate downtime at one at least one location.

- Spokane County will experience 13-22% increase in trains/day.

- The 5 study crossings with the largest increase in vehicles delays are all in Spokane County.

- Franklin Co. (Pasco) will experience 22% increase in trains/day.

- Yakima Co. (Yakima) will experience 42% increase in trains/day.

- Assuming coal trains travel at the same freight train speeds identified in Table 5.3-13, the five study crossings (of 44 study crossings located near or across state highways in Washington only) with the largest increase in daily vehicle delay compared to baseline 2028 conditions would be the following:

  Big Hanaford Road, Lewis County (8 coal trains daily, 10 mph)
  Pine Street, Spokane County (16 trains coal daily, 35 mph)
  F Street/Cheney-Spangle, Spokane County (16 coal trains daily, 35 mph)
  Cheney-Plaza Road, Spokane County (16 coal trains daily, 35 mph)
  Russel Avenue, Skamania County (8 coal trains daily, 20 mph)
  (Chap. 5 at 5.3-39)

- When factoring in existing annual average daily traffic, the five study crossings with the largest increase in vehicle delay compared to the baseline 2028 conditions would be the following:

Pines Road-SR 27, Spokane County (16 coal trains daily)
Park Road, Spokane County (16 coal trains daily)
Barker Road, Spokane County (16 coal trains daily)
Harvard Road, Spokane County (16 coal trains daily)
Flora Road, Spokane County (16 coal trains daily)

The DEIS fails to disclose likely impacts on all at-grade crossings in transportation corridors in Washington and fails to disclose similar impacts in any communities in Utah, Colorado, Wyoming, Montana, Idaho, and Oregon.

The DEIS shows that coal trains will travel through the city of Portland in Multnomah County. The 2013 report "The Human Health Effects of Rail Transport of Coal Through Multnomah County, Oregon" states:

> Because of their length (up to 1 1⁄4 miles long) and low speed, coal trains could block roadways for relatively long periods of time. In densely settled areas, such as the city of Portland, this could result in a cumulative delay of up to two hours per day at each crossing.[54] It could also disrupt routes and increase response times for emergency vehicles called to fires, medical incidents, and other public safety crises.

H. The DEIS fails to disclose the risks to human health and safety from rail accidents.

Among the more startling admissions of the DEIS is that the project will proximately cause a substantial increase in the number of rail accidents—a 22% increase statewide. What is not disclosed is any meaningful analysis of the potential safety, human health and environmental risks of such accidents. Increased rail traffic of the magnitude that is 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.

The DEIS also discloses:

- Unavoidable and Significant Adverse Environmental Impacts: "Proposed Action-related trains could increase the number of potential train accidents along in the rail routes in Cowlitz County and Washington State." (DEIS at 5.2-10)

- Unavoidable and Significant Adverse Environmental Impacts: Without improvements to increase capacity, the Reynolds Lead; BNSF Spur; and three

segments on the BNSF main line routes in Washington State (Idaho/Washington State Line–Spokane, Spokane– Pasco, and Pasco–Vancouver) are not projected to have the capacity to handle the projected baseline rail traffic and Proposed Action-related rail traffic in 2028. (DEIS at 5.1-24)

- Over 11 additional rail-related accidents are predicted every year statewide, with an additional accident every year in Longview. When looked at in terms of cumulative risk including other proposed projects, the DEIS predicts 19 coal train accidents per year.

- Coal trains would increase the accident probability at all at-grade crossings because 8 or 16 coal trains would pass at each crossing depending on location, and the Proposed Action would not change crossing protection at the study crossings.

- BNSF and UP could address safety issues as they emerge using capital improvements or operational changes, but it is unknown when those actions would be taken or permitted.

But the DEIS fails to disclose likely injuries and death from accidents at all at-grade crossings and along transportation corridors in Washington and fails to disclose similar impacts, including potential public health emergencies, to rail line communities in Utah, Colorado, Wyoming, Montana, Idaho, and Oregon.

I. The DEIS understates the number of increased derailments leading to injury, death, and public health emergencies.

The DEIS fails to disclose likely injuries and death from derailments in all transportation corridors in Washington and fails to disclose similar impacts to any communities in Utah, Colorado, Wyoming, Montana, Idaho, and Oregon.

Just this month, a unit train carrying Bakken crude oil derailed in the Columbia River Gorge near Mosier, Oregon, creating a massive fire, depleting the city's drinking water source, destroying the city's sewer system, closing an interstate highway, leaking oil into the Columbia River and threatening tribal fisheries. Initial reports blamed the incident on track failure.

The FEIS must disclose how frequent operations of coal unit trains—among the longest and heaviest trains on the rail system—contribute to higher-than-normal degradation of rail infrastructure, increasing the risk of rail accidents, injury, public health emergencies, and death. Given the desire to substantially increase the number of crude oil trains on the regional rail system, the FEIS needs to look closely at the extent to which the project will contribute not just to accidents generally but to crude oil

accidents specifically. Any increase in the risk of a crude oil accident it totally unacceptable.

J. The DEIS fails to adequately analyze the risk of fires and related dislocation, injury and death.

The DEIS inadequately addresses fires and how these may cause burn injuries and respiratory problems for individuals in and near the terminal, as well as people living in communities along the rail route, including low-income individuals and communities, minority populations, and individuals with pre-existing respiratory disease.

MBT will be dealing with a hazardous type of coal. Powder River Basin (PRB) coal is notorious for the hazard it presents regarding fires and explosions[1, 2, 3, 4, 5](de Place, E, 2016; Khambekar & Barnum, 2013; Doubery, 2013; Smoker & Albinger; Hossfeld & Hatt). This was a conclusion by NIOSH following an investigation into the deaths of two firefighters. They were killed in an explosion when trying to put out a fire of PRB coal[6, 7](Ellis, B, 2013; NIOSH, 2012).

Self-combustion of coal presents a fire risk[8] (USDOE, 1993) and this is an even greater problem with PRB coal which is twice as likely to self-combust than other types of coal[6, 9] (Ellis, B, 2013; Merritt & Rahm, 2000). It will not only smolder and catch fire while in storage piles at power plants and coal terminals, but has been known to be delivered to a power plant with the rail car or barge partially on fire[1, 10, 11] (de Place, 2016; groundtruthtrekking, 2014; Fox23, 2014).

PRB coal dust is also a fire hazard[9, 1e] (Merritt & Rahm, 2000; Block, S.). Sparks from machinery and heat from conveyor belts have caused major coal dust fires and explosions [4, 13,14] (Smoker & Albinger; VandenHeuvel & de Place, 2011; Casper Star Tribune, 2013). The potential for fires along the entire rail route is also a concern. BNSF has stated that coal dust deposits have caused fires in areas where coal dust has accumulated[15] (BNSF Railway). A fire department in Wyoming has found that coal fires along railroad tracks account for at least 50% of the department's summer call volume[16] (West Antelope II Coal Lease Application).

Operators familiar with the unique requirements of burning PRB coal say that it's not a case of "if" there will be a PRB coal fire, it's "when."[17](dePlace, E, 2014)

The 2013 report "The Human Health Effects of Rail Transport of Coal Through Multnomah County, Oregon" states:

> …Powder River Basin coal may be particularly susceptible to spontaneous combustion as a result of its chemical composition. According to discussions between mining and energy companies

> that handle Powder River Basin coal, there have been reports of fires in railcars and barges transporting this type of coal.
>
> Given coal's combustibility, fires and attendant injuries and property damage could also occur as a result of a train collision.

The FEIS must identify and analyze the risk of fire along with associated risks of injury, dislocation and death at the terminal in Longview and throughout the transportation corridor, including in forested areas like the Columbia Gorge, Stampede Pass, and communities east and west of the Cascades.

K. The DEIS fails to adequately analyze the risk to human safety from wildfires.

The DEIS discloses that Cowlitz County is considered a high-risk area:

> Cowlitz County is considered a high-risk area (Washington State Emergency Planning Division 2012c). A wildfire could affect the project area from the undeveloped areas adjacent to the project area or a Proposed Action-related train in the study area. Wildfires in Cowlitz County numbered more than 350 from 2004 to 2013, burning more than 561 acres. In late summer and early fall, dry easterly winds can produce extreme fire conditions. This threat has increased over time because of four climate-related factors: earlier snowmelt, higher summer temperatures, longer fire season, and an expanded vulnerable area of high-elevation forests (Washington State Emergency Planning Division 2012c) (DEIS at 5.8-32)

At Stage 2 (Full Build-out Operations), there could be 1.5 million metric tons of highly combustible PRB coal stored at the project site (DEIS 2-24). A wildfire leading to a terminal fire would have serious health impacts to workers and neighbors near and far and so must be fully analyzed in a Health Impact Assessment.

L. The DEIS fails to adequately analyze the risk to human health and safety from a vessel oil spill.

The DEIS demonstrates significant impacts from MBT's unprecedented proposal to increase vessel traffic by 44 percent in the Columbia estuary. The DEIS does not include a qualitative or quantitative risk analysis of bunkering (*i.e.,* refueling) associated with 840 vessels per year calling on MBT. The DEIS, however, acknowledges oil spill risks associated with bunkering, stating:

> Increased vessel traffic associated with the Proposed Action also has the potential to result in an increased risk of oil spills during bunkering activities. Causes of oil spills during bunkering transfers include

> overflow of the tank, parting the hose due to mooring fault, operator error in connecting the hose, failure of the hose or pipework, and failure of bunker tanks (HSE 2012). Experience from insurance claims (Gard 2002) is that most bunker spills result from an overflow of the bunker tank due to carelessness or negligence, either on the part of those supplying the bunkers, or those on board the vessel receiving them.

If an incident occurred that resulted in an impact, a fuel tank could be damaged and fuel spilled.[16]

Bunker fuel is a combustible liquid associated with acute health hazards and chronic health hazards. A Material Data Safety document shows potential health impacts of acute exposure:

- *Inhalation*: May cause irritation to the nose, throat and upper respiratory tract. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.
  Irritating or noxious gases may be released during thermal decomposition.
- Releases: Hydrogen sulfide. Severe respiratory irritation (from vapors or mists) is possible. Could also cause convulsions, coma, respiratory arrest and death.
- *Skin*: May cause mild to moderate skin irritation. Prolonged contact, such as when trapped against the skin under clothing or jewelry, may be more irritating. Can be absorbed through skin. Exposure to hot material may cause thermal burns.
- *Eyes*: May cause moderate eye irritation.
- *Ingestion*: May cause irritation of mouth, throat, and stomach. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.

Potential impacts of long-term (chronic) exposure:

- Prolonged skin contact may cause dermatitis (rash), characterized by red, dry, itching skin.
- Prolonged overexposure may cause liver and kidney effects.

Carcinogenic status: Possible cancer hazard

Fire hazards/conditions of flammability: Combustible liquid and vapor. Will ignite when exposed to heat, flame and other sources of ignition. Vapors are heavier than air and collect in confined and low-lying areas. Vapor can travel to ignition source and flash back. Product may float, and be re-ignited at the water's surface. Closed

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[16] SEPA Vessel Transportation Technical Report at 3-13 (April 2016).

containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. [17]

M. The DEIS fails to adequately analyze the risk to clean drinking water.

The DEIS discloses that "Day-to-day rail operations could release contaminants to water resources immediately adjacent to the rail line, resulting in the potential for water quality impairment from increased rail transportation." (Summary at S-24.) That means multiple unidentified sources of precious drinking water could be impaired. The DEIS fails to identify by name and location all domestic and municipal water systems that could be harmed by a derailment and spill of coal trains and/or coal vessel fire and fuel spill. How many people are served by those systems? Who will pay for monitoring and cleanup when and if municipal drinking water sources are fouled in Washington, Oregon, Idaho, Utah, Colorado and/or Montana?

The MBT project area contains a critical aquifer recharge area (4.3-17). The DEIS discloses that The Mint Farm Regional Water Treatment Plant is approximately 6,000 feet east of the eastern boundary of the project area and supplies drinking water to about 45,000 residents of Longview and the surrounding area. While the study area does not extend to the Mint Farm Regional Water Treatment Plant, the project area lies within the Wellhead Protection Area (i.e., the 5-year Wellhead Protection Plan Source Area). (DEIS at 4.4-5)

An important document (Table 5-3 at p. 5-5, February 2012) demonstrates the flow of water in the Source Delineation Area.[18]

The plant draws from the deep aquifer, recharged by the Columbia River. Kennedy/Jenks Consultants (2010) completed a water quality and environmental risk assessment as part of the preliminary design report for the Mint Farm Regional Water Treatment Plant. The risk assessment included sampling and water quality analysis of the groundwater from the deeper aquifer of six wells. This study found no chemicals in the groundwater above their respective human health screening levels. (DEIS at 4.4-5)

However, in November 2012, Kennedy/Jenks Consultants repeated the water quality analysis from the same wells and found manganese and iron at levels above the Washington State Department of Health secondary water quality standards.

They also found that arsenic was present in one of the city's drinking water wells, though at levels below thresholds established by the U.S. Environmental Protection Agency (EPA) for drinking water quality standards. (DEIS at 4.4-5,6)

Arsenic is present in PRB coal and Uinta coal. (See Leyda EXHIBIT and see Table 4.5-4 at p. 4.5-25.)

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[17] EXHIBIT: Material Data Safety Sheet Revised 1.12.2013 Heavy Fuel Oil, Bunker Fuel Oil

[18] http://www.mylongview.com/modules/showdocument.aspx?documentid=998

Arsenic is present in the Columbia River. DEIS Table 4.5-5 demonstrates a proposed 303(d) listing for impairment for Columbia River in Oregon near River Mile 64 for arsenic. (Table 4.5-3)

With repeated exposure to arsenic-tainted DPM and arsenic-laden coal dust and with 1.5 million metric tons of coal sitting on site at full operation, it is possible that contamination of this drinking water source by arsenic and other pollutants could become a bigger problem than it currently is.

Groundwater in the study area is confirmed to have benzene and petroleum/gasoline contamination above cleanup levels. (DEIS 3.6-13)

The DEIS fails to disclose the fact that dredging and construction of the docks could impact drinking water. MBT dredging would increase water depth in the dredge prism by up to 16 feet (DEIS at 4.7-22). How will this impact the quality and quantity of drinking water and the movement of water in the city's wellhead protection area?

The DEIS fails to disclose the potential individual and cumulative impacts from a spill of bunker oil, emissions of coal dust, and exposure to diesel PM 365 days each year for 50 years at and near the terminal. These impacts can degrade the quality of drinking water for Longview residents.

The DEIS fails to clearly show what the effects of pre-operation wicking and compression may have on the movement of surface water or on the movement of legacy pollutants like benzene and arsenic, which could degrade drinking water.

The DEIS fails to disclose the potential impacts of heavy pumping of MBT's private wells during the dry season (for purposes of dust suppression) on the City of Longview's wells.

The DEIS fails to identify the contaminants and pollutants which will flow into the Columbia River as treated wastewater, untreated surface water or as overflow from storms. That water could include diesel pollution, toxic coal dust, fuel spills, asbestos, lead, and arsenic from demolition projects. Leaks and spills from associated barges, tugs, Panamax-class, and Handymax-class vessels can foul the water that recharges the drinking water aquifer.

Rainier's drinking water wells are located just upstream. Given tidal influences, that water source could be subject to contamination by the above pollutants as well. Rainier's designated well-head protection area is located near the project site and appears to overlap the project area.

The DEIS fails to identify those who will pay damages if the drinking water sources for the City of Longview and the City of Rainier are contaminated with pollutants as a result of this project and must be permanently replaced. It also fails to contemplate the cost of temporary replacement of clean drinking water.

II. THE DEIS UNDERSTATES THE HEALTH IMPACTS AND RISKS TO VULNERABLE INDIVIDUALS AND COMMUNITIES

The DEIS discloses that "Because the area along the Reynolds Lead where the indirect noise impacts would occur is a minority and low-income community (Figure 3.2-4), this analysis concludes that the Proposed Action would have a disproportionately high and adverse effect on minority and low-income populations."

However, the DEIS fails to fully recognize the many other direct and indirect negative impacts of this massive project that would burden minority, low-income populations, and tribal communities in Longview and all along transportation corridors. This failure to appropriately scope EJ-related issues and its startlingly narrow definition of the project plan mean that the project's primary EJ analysis is inadequate. The FEIS must incorporate a thorough and accurate analysis of impacts to Environmental Justice as they relate to human health and safety.

The EJ components of the FEIS should take into consideration both the HIA planned for the MBT analysis, and extend all EJ analyses to communities along the rail line, at the project site, in vessel corridors, and to those most impacted by the climate impacts of the project.

The health and safety of sovereign tribal members and entities can be directly impacted by increased train traffic, and by obstructing traditional access to the Columbia River. Along the length of the rail routes from the Powder River Basin to this proposal, dozens of indigenous tribes' hunting and fishing rights could be impacted by obstruction of access to rivers and hunting grounds. With millennia of traditional access to fish and wildlife for subsistence harvest, any further degradation of fishing and hunting rights by new industrial projects must be taken into account.

The combined and cumulative harm that could come to fisheries from both oil and coal transport along Northwest waterways such as the Columbia River must be more fully considered. The DEIS understates the negative impacts of MBT to food and culture to tribes. "Operation of the Proposed Action would result in impacts on tribal resources through activities related to the Proposed Action causing physical or behavioral responses in fish, or affecting aquatic habitat. These impacts could reduce the number of fish surviving to adulthood and returning to areas upstream of Bonneville Dam, thereby affecting the number of fish available for harvest by the tribes." We object to any project that causes significant impacts to tribal fishing.

The following words are taken from a prepared statement of the Yakama Nation given November 18, 2013, at an Oregon Physicians for Social Responsibility press

conference: "First and foremost, given the direct and indirect impacts that the coal export proposals would have on the Yakama People and our Treaty-reserved rights and resources, Yakama Nation is fully opposed to all coal export proposals, including the Millennium Bulk Terminal project at the Port of Longview. As such, Yakama Nation continues to ask all permitting agencies, including the U.S. Army Corps of Engineers and other state and local authorities to deny any and all permits related to these proposals. To be clear, Yakama Nation will not negotiate nor agree to so-called mitigation for any violations of its Treaty-reserved rights."

The FEIS should include deep analysis of Longview residents and those living along transportation corridors utilizing the full power and resources of U.S. EPA's Environmental Justice screening tool (EJSCREEN). This tool combines demographic variables identifying potential susceptible or vulnerable populations with separate environmental indicators to derive separate EJ Indices that reflect whether those populations are facing excess environmental risk for an environmental indicator. The results for coal train and vessel routes through Washington en route to MBT clearly show multiple municipalities and disproportionately impacted communities where disparate risk should be further evaluated as part of the FEIS. (See https://www.epa.gov/ejscreen.)

The DEIS fails to recognize the negative, cumulative health impacts for vulnerable populations, including pediatric asthmatics, those with COPD, heart disease, diabetes, women over 50, exposed workers, the elderly and those living in poverty. The FEIS should include information provided through the May 15, 2013, Community Health Needs Assessment[19] to fully appreciate the overall health status of the community and the substantial numbers of residents living with chronic disease. (See Tables 4,5,6,7) The rate of premature death in the county is high relative to the rest of the state. The health of county residents is further threatened by degradation of air quality from MBT's dirty project.

The FEIS and HIA must also incorporate a thorough and accurate analysis of the health and safety risks to workers at the proposed MBT terminal. In 1969, the Coal Mine Health and Safety Act was created to protect the health of miners. Despite apparent advances, in 2012 researchers at the National Institute for Occupational Safety and Health discovered an almost 10-fold increase in coal workers' pneumoconiosis—or black lung disease.[20] That finding led to the CDC looking closely at surface mine

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[19] https://www.peacehealth.org/sites/default/files/Documents/CHNA-PHSJ-2013.pdf
[20] David J. Blackley, Cara N. Halldin, and A. Scott Laney "Resurgence of a Debilitating and Entirely Preventable Respiratory Disease among Working Coal Miners", American Journal of Respiratory and Critical Care Medicine, Vol. 190, No. 6 (2014), pp. 708-709. doi: 10.1164/rccm.201407-1286LE

workers—an understudied group. Here too, evidence was found of serious, occupation-related respiratory illness in many of the workers.[21]

Coal work remains an occupation with great health risks. These risks are exacerbated by the fact that workers who will be exposed to the most coal dust will also be the people who are regularly exposed to highest levels of diesel particulates and other air toxins. In the case of particulate matter, the health risks correlate with exposure and there is no level of exposure at which adverse health risks are not seen.

This DEIS lacks sufficient data to convince us that this would be safe work, when there is substantial evidence to the contrary. It most certainly does not follow the precautionary principle—by first insuring the protection of workers' health.

A comprehensive Health Impact Assessment should be produced and made available for public comment. Given the undeniable threat to worker health, the "No Action Alternative" should be selected. We need to move beyond these sorts of dirty and dangerous projects—and focus instead on creating living wage jobs that are healthy for workers and the greater community.

III. THE DEIS FAILS TO RECOMMEND ADEQUATE MITIGATION MEASURES

The DEIS correctly states that there are significant and adverse impacts of this project that cannot be mitigated.

Mitigation means stopping the exposure before it happens by using methods to neutralize that exposure. Where are the requirements to enclose coal piles at the terminal? Where are the requirements to enclose or capture coal dust rising from open conveyor belts? The DEIS suggests mitigation measures that are inadequate and largely depend on measurements of contamination after exposures to hazardous materials, physical agents, or harmful events have occurred. Significant health impacts will already have been experienced. Short term and intermittent exposures are not given appropriate consideration. This is exemplified by the discussions in the DEIS of potential noise exposures and coal dust exposures. In these cases, monitoring has been substituted for mitigation.

Monitoring complaints will serve to alert authorities to a problem only after the fact. How many children in the affected communities will have their sleep disturbed by unexpected and uncontrollable noise exposures, such as noise from train horns? What will be the impacts on learning and development? The DEIS states that 229 residences

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[21] Pneumoconiosis and Advanced Occupational Lung Disease Among Surface Coal Miners — 16 States, 2010–2011. (2012, June 15). Retrieved May 23, 2016, from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6123a2.htm

would experience moderate noise impacts and 60 residences would experience severe noise impacts from proposed action-related trains. How will this harmful-to-health noise exposure to these families be mitigated? The DEIS suggests monitoring complaints from the community and/or constructing FRA approved "quiet zones".

Thus, unavoidable and significant adverse impacts on the health of the community will result from this project. If a person is exposed to and inhales a blast of coal dust and/or DPM for five minutes, that person has already experienced health impacts. It is too late for mitigation.

Added trains for this project will contribute to many rail segments exceeding capacity and increase the risk of train accidents. "While it is likely that rail companies would make investments or changes to accommodate the growth in rail traffic, it is unknown what these actions would be or when they would be permitted or built." What is suggested as mitigation for this increased risk? "Before each stage of operations that would increase the number of trains, Millennium would coordinate with the rail companies. A report will be prepared to document the coordination." (DEIS, Rail Transportation and Rail Safety Fact Sheet) Such a "report" cannot possibly mitigate the impacts of a train accident.

Although the DEIS describes risks to communities, it minimizes them and does not examine or predict with data the potential health risks resulting from its proposed actions. The community may gain relatively few, unsafe and unhealthy jobs at the expense of increased infrastructure and health care costs and shortened life expectancies.

IV. THE DEIS FAILS TO INCLUDE A HEALTH IMPACT ASSESSMENT (HIA)

The DEIS examines air quality, water quality, traffic delays, noise and light pollution and confirms some serious health impacts but it is also incomplete. The Draft EIS fails to incorporate a Health Impact Assessment (HIA).

Before and during scoping, many organizations and municipalities called for an HIA for this, the largest coal export project in the U.S. They include but are not limited to the City of Portland, the City of Mosier, the City of Milwaukee, the City of Beaverton, the City of Eugene, the Oregon Environmental Justice Task Force, and The Yakama Nation. (All references here are included in EXHIBITS.)

Because negative health impacts from climate change will be a result of the MBT project, we request that the FEIS include a Health Impact Assessment. Because exposure to toxic air and water pollution is a direct impact of MBT, we request that the FEIS include a Health Impact Assessment. Because increased frequency of very long

trains and derailments along the many train corridors will be a direct result of the MBT, we request that the FEIS include a Health Impact Assessment.

It is incumbent upon the decision makers in this process to apply the *best available science* in determining the health impacts of the MBT. 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 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 MBT.** (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 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. (See References: DPM.)

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 MBT will occur to populations in close proximity to the tracks, the terminal, and shipping lanes. **Thus, we recommend that the near source health effects be quantified spatially all along all transportation corridors, not just for the terminal site. This will necessarily include all railway and vessel corridors.**

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 independent consultants familiar with the models and with interpreting the results of the models.

If any mitigation measures including, but not limited to, construction of a terminal building to enclose piles of coal, covered rail cars at the project site, other pollution control devices, ultra-low sulfur fuel specifications, and late model diesel locomotives are used in emissions estimates and models, those assumptions should be listed in the FEIS as **required** mitigation.

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.

Because this would be the largest coal export facility in the US, it is imperative that a HIA is produced and that the HIA is a state-of-the art assessment that takes a comprehensive approach to health and health care costs, while incorporating the values of equity, environmental justice, democracy, sustainable development, and ethical use of evidence. Please utilize the full resources available on EPA's EJ Screen.

Please answer public health and safety questions submitted during the scoping process, including those listed in Exhibit: "OPSR Scoping Comments for MBT #1."

The HIA is a very important tool for decision makers and must be made available so the public can review and comment on it. Because this action will not be accomplished during the DEIS comment period, the public must be provided the opportunity to comment on a draft HIA before a Final HIA is produced.

Thank you for consideration of these comments,

Sincerely,

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

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Oregon and Washington Physicians for Social Responsibility (3327)

RESOLUTION No. 36962

Amend Resolution for City policy opposing coal trains traveling through the City of Portland to add a section on Health Impact Assessment (Resolution; amend Resolution No. 36959)

WHEREAS, substitute Resolution No. 36959, which opposes coal trains traveling through the City of Portland until a programmatic, comprehensive and area-wide Environmental Impact Statement is completed, was adopted on September 19th, 2012; and

WHEREAS, Resolution No. 36959 inadvertently omitted an action item that had been noticed to the public and referenced in the findings; and

WHEREAS, the omitted action item indicated that the City of Portland supports the development and review of a comprehensive Health Impact Assessment prior to approval of coal export permits by any state, regional or federal agency.

NOW, THEREFORE, BE IT RESOLVED, that Resolution No. 36959, which opposes coal trains traveling through the City of Portland, is amended to add a sentence in the Be It Resolved Section that states:

> *"BE IT FURTHER RESOLVED that the City of Portland supports the development and review of a comprehensive Health Impact Assessment prior to approval of coal export permits by any state, regional or federal agency."*

BE IT FURTHER RESOLVED, that all other terms and provisions of Resolution No. 36959 remain the same and are not affected by this amendment.

OCT 04 2012

Adopted by the Council:

Commissioner Fritz
Prepared by: Thomas Bizeau
Date Prepared: Sept. 27th, 2012

LaVonne Griffin-Valade
Auditor of the City of Portland
By Susan Parsons
Deputy

Oregon and Washington Physicians for Social Responsibility (3327)

1118

Agenda No.
RESOLUTION NO. 36962
Title

Amend Resolution for City policy opposing coal trains traveling through the City of Portland to add a section on Health Impact Assessment (Resolution; amend Resolution No. 36959)

INTRODUCED BY Commissioner/Auditor: **Comm Fritz**	CLERK USE: DATE FILED SEP 28 2012
COMMISSIONER APPROVAL	LaVonne Griffin-Valade Auditor of the City of Portland
Mayor—Finance and Administration - Adams	
Position 1/Utilities - Fritz	By: _____ Deputy
Position 2/Works - Fish	
Position 3/Affairs - Saltzman	
Position 4/Safety - Leonard	**ACTION TAKEN:**
BUREAU APPROVAL	
Bureau: N/A Bureau Head:	
Prepared by: Milena Malone Date Prepared: September 26, 2012	
Financial Impact & Public Involvement Statement Completed ☒ Amends Budget ☐	
Portland Policy Document If "Yes" requires City Policy paragraph stated in document. Yes ☐ No ☒	
Council Meeting Date **October 4, 2012**	
City Attorney Approval: required for contract, code. easement, franchise, charter, Comp Plan	

AGENDA

TIME CERTAIN ☐
Start time: _____

Total amount of time needed: _____
(for presentation, testimony and discussion)

CONSENT ☒

REGULAR ☐
Total amount of time needed: _____
(for presentation, testimony and discussion)

FOUR-FIFTHS AGENDA	COMMISSIONERS VOTED AS FOLLOWS:	YEAS	NAYS
1. Fritz	1. Fritz	✓	
2. Fish	2. Fish	✓	
3. Saltzman	3. Saltzman	✓	
4. Leonard	4. Leonard	—	—
Adams	Adams	✓	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 10 2015

MEMORANDUM

SUBJECT: Promoting the Use of Health Impact Assessment to Address Human Health in Reviews Conducted Pursuant to the National Environmental Policy Act and Section 309 of the Clean Air Act

FROM: Susan E. Bromm
Director
Office Enforcement and Compliance Assurance (OECA)
Office of Federal Activities (OFA)

Michael Slimak
Director
Office of Research and Development (ORD)
Sustainable and Healthy Communities (SHC) Research Program

TO: Regional NEPA Directors
Regional 309 Environmental Review Coordinators

Health Impact Assessment (HIA) is a decision support tool that provides a means of factoring evidence-based health considerations into the decision-making process. HIA has been described as "a systematic process that uses an array of data sources and analytic methods, and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects."[1] HIA promotes a broad definition of health, beyond the mere absence of disease or infirmity, and provides evidence-based recommendations to address disproportionate health effects, mitigate potential adverse health effects, and bolster potential beneficial health effects of the proposed decision.

The practice of HIA has been seen as a way to not only enhance human health considerations in the NEPA process, but also ensure considerations of environmental justice (EJ) and children's health (as called for in Executive Orders 12898 and 13045, respectively) due to its ability to:

- Provide the lead agencies and other stakeholders with information on the potential health effects of a proposed action and its alternatives, through the broad consideration of impacts to health and health determinants and deliberative engagement of community members and other stakeholders throughout the HIA process;

[1] National Research Council. (2011). *Improving Health in the United States: The Role of Health Impact Assessment*. Washington, D.C.: The National Academies Press.

- Identify disproportionate human health and/or environmental effects, including high and adverse impacts, of a proposed action and its alternatives on minority and tribal populations, low-income populations, and vulnerable populations, such as children and the elderly, and develop recommendations to address those effects; and
- Develop recommendations to promote the health benefits of a proposed action and its alternatives and/or mitigate against potential negative health impacts before the action is implemented.

OFA and SHC will be working together to consider the use of HIA in the NEPA process as part of EPA's NEPA/Section 309 reviews. More specifically, we are working to:

- Develop screening and scoping tools for use by Regional NEPA/Section 309 reviewers to identify proposals that could benefit from an HIA or HIA elements, based on the proposal's potential for significant impacts on human health.
- Develop web-based training to educate Regional NEPA/Section 309 reviewers on HIA, the HIA process, and the role HIA may play in the NEPA process.
- Partner with a federal agency (or agencies) to conduct a pilot project integrating HIA into an environmental impact statement and/or assessment, using general HIA best practices identified in EPA's systematic review of health impact assessments in the U.S.[2] and lessons learned from the HIA field of practice for integrating HIA into environmental impact assessment.

We welcome your input on these efforts, and we will be forming a workgroup to ensure Regional participation. For questions, please contact Julie Roemele, NEPA Compliance Division, at 202-564-5632 (roemele.julie@epa.gov) or Florence Fulk, ORD, at 513-569-7379 (fulk.florence@epa.gov).

cc: Florence Fulk, Office of Research and Development
Julie Roemele, Office of Federal Activities

[2] Rhodus, J., F. Fulk, Brad Autrey, S. O'Shea, and A. Roth. (2013). *A Review of Health Impact Assessments in the U.S.: Current State-of-Science, Best Practices, and Areas for Improvement*. EPA/600/R-13/354. Washington, DC: U.S. Environmental Protection Agency.

RESOLUTION NO. 4182

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BEAVERTON, OREGON, EXPRESSING OPPOSITION TO TRANSPORTING COAL ACROSS THE STATE OF OREGON AND THROUGH THE COLUMBIA RIVER GORGE DUE TO NEGATIVE HEALTH IMPACTS AND NEGATIVE IMPACTS TO THE EARTH'S CLIMATE

WHEREAS, mounting evidence demonstrates the negative health impacts of coal mining, processing, transport and combustion; and

WHEREAS, air quality studies show living near major transportation routes and industrial areas correlates with higher rates of respiratory and other illnesses; and

WHEREAS, studies show mining and burning coal releases harmful greenhouse gases into the atmosphere, accelerating climate deterioration, and the mining of coal can result in erosion and toxic waste; and

WHEREAS, toxic pollutants from coal-fired energy plants in Asia rise in the winds and are carried in the jet streams over the Pacific Ocean, resulting in increased air pollution in the Pacific Northwest; and

WHEREAS, studies have shown that mercury -- a potent neurotoxin -- is released from burning coal; and

WHEREAS, up to 500 pounds of coal dust can escape from each rail car in transit which is a health concern because it can cause asthma attacks, pulmonary inflammation, bronchitis, emphysema, and cancer; and

WHEREAS, coal is commonly transported via open-top rail cars or barges that allow the spread of coal dust and chunks of coal; and

WHEREAS, more than twenty cities and counties in the Pacific Northwest have passed resolutions or written letters expressing their concern about the potential adverse impacts of coal exports in their communities, and called for the Army Corps to study the cumulative and comprehensive impacts of coal exports; and

WHEREAS, the State of Oregon has been a national leader in creating clean-energy jobs and innovating, developing, demonstrating, and marketing clean energy technologies and practices that promote sustainable global economic development, and coal export promotes damaging and unsustainable energy development practices;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BEAVERTON, OREGON:

1. The City of Beaverton opposes coal exports through the Columbia River Gorge and supports economic growth that does not jeopardize the State of Oregon's commitment to fight the serious impacts of climate change.

2. The City of Beaverton requests that the railroad mitigate any public safety hazards created by the transport of coal through the State of Oregon.

3. The City of Beaverton requests that railroads monitor the loading of coal at mines and at any transfer point as part of their contracts with the coal companies to assure best loading practices and to reduce the amount of coal and coal dust coming out of rail cars in route.

4. The City of Beaverton supports economic growth that contributes to citizens' health, safety, and well-being, and that on balance, adheres to principles of sustainable development and an overall reduction of carbon emissions.

5. The City of Beaverton requests that the Army Corps of Engineers, the Bureau of Land Management and other responsible federal agencies undertake to perform a programmatic, comprehensive and area-wide Environmental Impact Statement (EIS), studying the cumulative and comprehensive impacts of increased coal production from federal lands and all proposed coal export terminals in Oregon and Washington, and that site-specific EISs be conducted as well to allow for fully informed decisions before approval of any coal export facility.

6. The City of Beaverton supports the development and review of a comprehensive Health Impact Assessment prior to approval of coal export permits by any state, regional of federal agency.

Adopted by the Council this 18th day of June, 2013.

Approved by the Mayor this 19th day of June, 2013.

AYES: 3 NAYS: 2

ATTEST:

Catherine Jansen, City Recorder

APPROVED:

Denny Doyle, Mayor

RESOLUTION NO. 55-2012

A RESOLUTION TO OPPOSE THE TRANSPORT OF COAL THROUGH MILWAUKIE, OREGON

The City Council of the City of Milwaukie finds that:

A. There are currently proposals for projects that would result in the increase of the shipment of coal in open-aired freight trains and barges through Oregon and Washington, including as many as four to eight, one to one and a half mile trains passing through Milwaukie per week. Even at 30 to 40 miles per hour, these trains could block intersections in Milwaukie for two to three minutes at a time. The coal trains would operate on the Union Pacific Railroad which generally bisects the city, separating a significant residential section of Milwaukie from its downtown. This condition is of heightened concern as a single train could simultaneously block the three at-grade crossings at Harrison Street, Oak Street, and 37th Avenue, which are immediately adjacent to the Milwaukie Public Safety Building that houses Police and Fire services.

B. According to findings from the Environmental Protection Agency and research in other communities, coal trains are likely to cause significant negative effects on Milwaukie's public health, economy, and air and water quality.

C. These mile and a half long trains which typically carry 100 tons of coal can lose up to 3% of their load in transit in coal dust. The train cars are not likely to be covered due to the danger of fires presented by the use of fully enclosed cars.

D. This coal dust will have a negative effect on local businesses, homes and natural areas. Property values along coal transport routes have also been shown to decline. As well, local food production is likely to sustain adverse effects which are counter to our community's desire to increase local healthy food production and the promulgation of community gardens.

E. Coal dust contains toxic heavy metals, including mercury, arsenic, and lead, all known to have serious adverse health effects, especially on children. These heavy metals are linked to increases in cancer, bronchitis, emphysema, black lung disease and birth defects.

F. The open-aired freight cars that coal is transported in are designed to drain moisture from the bottom of the car. Water seeping from the bottom of these cars could carry coal dust onto the track-way and eventually into the groundwater from which Milwaukie draws its drinking water.

G. Mercury and other toxic air pollutants produced from burning the coal in Asian nations have been shown to adversely affect the Northwest's air, water, fish, and wildlife.

H. Derailment is more likely in coal trains than in other trains. Because many homes and businesses are in such close proximity to the rail alignment, a coal train derailment could result in significant property damage to residents or business owners in Milwaukie.

I. The City of Milwaukie is a leader in the fight for clean air and against the negative impacts from climate change, as evidenced by signing onto the US Mayors Climate Protection Agreement. The City has also committed to reducing its environmental impacts in its day-to-day operations. The Milwaukie Sustainability Team (S-Team) is a committee made up of representatives from various City Departments that meets bimonthly to discuss sustainability issues. This group created the Sustainable City Plan, which was approved and adopted by City Council via resolution in March 2009. This Plan guides the City's actions in reducing the environmental impact of the City's day-to-day operation. The plan has four target action areas, namely: Waste Reduction, Energy & Fossil Fuel Consumption, Procurement, and Ongoing City Commitment & Education. The City has further committed to participate in the Portland General Electric's renewable energy clean wind green tag program for a minimum of a year, and instituted a Green Power Challenge to encourage residents to participate.

NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MILWAUKIE, a Municipal Corporation of the State of Oregon, as follows:

Section 1. Allowing coal trains to pass through our City is not compatible with the City's efforts to improve air quality, enhance public health, and promote local food production.

Section 2. Allowing trains or barges to pass through the State of Oregon transporting coal in the volume and of the type planned is not compatible with the environmental future desired by our City residents.

Section 3. All applicable federal, state, and local laws protecting public health, safety, and air and water quality should be enforced to protect the citizens of Milwaukie and the state of Oregon from the adverse effects of coal trains and barges.

Section 4. The City fully supports Governor John Kitzhaber's request that a federal agency prepare a programmatic and comprehensive environmental impact statement (EIS) under the National Environmental Policy Act to look at the unprecedented number of coal export proposals pending in the Pacific Northwest, as well as the potential effects in this country of the use of coal in Asia. Now is the time for a programmatic EIS, before substantial and irreversible commitments of resources are made.

Section 5. The City of Milwaukie joins the call for review of a comprehensive independent Health Impact Assessment before any permits are approved for any proposed coal export project.

Section 6. This resolution shall be sent to Governor Kitzhaber, Senators Wyden and Merkley, Congressman Schrader, Secretary of the Interior Salazar, Secretary of the Army McHugh, General Temple of the US Army Corp of Engineers, Director Abbey of the Bureau of Land Management, our local state legislative delegation; in addition the City shall lobby on its behalf where appropriate.

Section 7. This Resolution is effective immediately upon its passage by the City Council.

The foregoing Resolution adopted on the 16 day of October, 2012.

Jeremy Ferguson, Mayor

ATTEST:

Pat DuVal

Pat DuVal, City Recorder

APPROVED AS TO FORM:
Jordan Ramis PC

City Attorney

SUBSTITUTE

RESOLUTION No. 36959

Adopt a policy opposing coal trains traveling through the City of Portland until a programmatic, comprehensive and area-wide Environmental Impact Statement is completed. (Resolution)

WHEREAS, the City of Portland and State of Oregon have committed to greenhouse gas reduction goals; and

WHEREAS, in 2009 the City of Portland approved the Climate Action Plan, with a goal of achieving a 40 percent reduction in carbon emissions by 2030 and an 80 percent reduction by 2050; and

WHEREAS, in 2011, the City and the County determined that people, businesses and organizations had successfully undertaken climate protection initiatives resulting in a reduction in carbon emission of 26 percent per person compared with 1990; and

WHEREAS, increasingly, evidence demonstrates the negative impacts of fossil fuel mining, processing, transport and combustion on the environment and upon human health and the imperative for development of clean renewable energy sources; and

WHEREAS, in 2010 the City of Portland worked with many community partners and Portland General Electric to arrive at an agreement to cease coal operations at the Boardman power plant, Oregon's only coal-burning power plant, by 2020 (Exhibit A); and

WHEREAS, toxic pollutants from coal-fired energy plants in Asia rise in the winds and are carried in the jet streams over the Pacific Ocean, resulting in increased air pollution in the Pacific Northwest; and

WHEREAS, studies have shown that mercury— a potent neuro-toxin —is released from burning coal; and

WHEREAS, up to one ton of coal dust can escape from each rail car in transit which is a health concern because it can cause asthma attacks, pulmonary inflammation, bronchitis, emphysema, and cancer; and

WHEREAS, over 135 Oregon physicians, 180 health professionals and public health advocates, the Environmental Justice Task Force, the Chairs of 14 North Portland Neighborhood Associations, and the Yakama Nation have called on Governor Kitzhaber to review a comprehensive Health Impact Assessment before approving any coal export permits; and

WHEREAS, it is anticipated that new coal export terminals along the Columbia River and the Northwest coast will result in significant increases in train traffic on rail corridors through Portland; and

WHEREAS, noise, diesel emissions, and toxic coal dust from the increased rail traffic will negatively impact the livability of Portland's neighborhoods and the health of our citizens; and

WHEREAS, increased rail traffic through Portland will obstruct local roads, causing additional noise, air pollution, loss of property values, delays of emergency vehicles, commuters, business and domestic traffic in residential communities and business districts; and

WHEREAS, Portland has strived to be a leader in developing and implementing clean energy technologies and practices, promoting sustainable economic development and creating clean-energy jobs; and

WHEREAS, more than twenty cities and counties in the Northwest have passed resolutions or written letters expressing their concern about the potential adverse impacts of coal exports in their communities, and called for the Army Corps to study the cumulative and comprehensive impacts of coal exports; and

WHEREAS, local, state and federal officials including Mayor Sam Adams and Governor John Kitzhaber have expressed concerns about the real and potential harm to our collective communities, as well as called on the Army Corps of Engineers to require a comprehensive Environmental Impact Statement (EIS) for the proposed coal export facilities in Oregon and Washington (See Exhibits B-C); and

WHEREAS, the Linnton Neighborhood Association, the North Portland Coalition of Neighborhoods, and the Southeast Uplift Coalition of Neighborhoods, which are adjacent to rail lines, have called for an area-wide or programmatic Environmental Impact Statement to be performed; and

WHEREAS, Environmental Assessments, as the Army Corps of Engineers currently requires, do not thoroughly review the impacts or allow for sufficient public input; and

WHEREAS, coal trains traveling through our city will have significant consequences for Portlanders, and it is of paramount importance that community members are fully engaged in the decision-making process from the beginning; and

WHEREAS, undertaking the process of performing a programmatic and comprehensive Environmental Impact Statement will ensure that the effects of increased coal export, its alternatives, and possible mitigations, are fully considered, and that the community has adequate opportunity to comment; and

NOW THEREFORE BE IT RESOLVED that the City of Portland opposes coal export on trains through its jurisdiction until the process of a programmatic, comprehensive and area-wide Environmental Impact Statement, is completed; and

Oregon and Washington Physicians for Social Responsibility (3327)

BE IT FURTHER RESOLVED, that the City of Portland joins with Governor Kitzhaber in asking that the Army Corps of Engineers, the Bureau of Land Management and other responsible federal agencies undertake to perform programmatic, comprehensive and area-wide Environmental Impact Statements, studying the cumulative and comprehensive impacts of increased coal production from federal lands, and the five proposed coal export terminals in Oregon and Washington, to allow for fully informed decisions before approving any coal export facility; and

BE IT FURTHER RESOLVED that the City of Portland intends to address any impacts to public health, safety and property caused by the transport of coal through Portland by actively enforcing applicable local public health, safety, building, electrical and fire codes; and

BE IT FURTHER RESOLVED that the City of Portland intends to address any impacts to surface and groundwater caused by the transport of coal through Portland by actively enforcing any applicable environmental statutes delegated to the City of Portland; and

BE IT FURTHER RESOLVED that the City of Portland will request that the Railroad companies make public any development plans for increased rail traffic through Portland to accommodate coal exports, and to provide adequate notice to Portland citizens of any plans for new or expanded rail facilities or any anticipated increases in rail traffic volume; and

BE IT FURTHER RESOLVED that the City of Portland will request that the Railroads provide representatives to meet periodically with local citizen groups and local government officials to address local concerns regarding coal trains through Portland; and

BE IT FURTHER RESOLVED that the City of Portland will request that the Railroads mitigate any public safety hazards created by the transport of coal through Portland; and

BE IT FURTHER RESOLVED that the City of Portland will request that the Railroads submit an emergency environmental cleanup plan in case of accidental spills or train derailment; and

BE IT FURTHER RESOLVED that the City of Portland supports economic growth that contributes to citizens' health, safety, and well-being, and that on balance, adheres to principles of sustainable development and an overall reduction of carbon emissions.

Adopted by the Council: SEP 19 2012

Commissioner Fritz
Prepared by: Milena Malone
Date Prepared: [Sept. 18th, 2012]

LaVonne Griffin-Valade
Auditor of the City of Portland
By Susan Parsons
Deputy

Oregon and Washington Physicians for Social Responsibility (3327)

S-1073

SUBSTITUTE

Agenda No.
RESOLUTION NO. 36959
Title

Adopt a policy opposing coal trains traveling through the City of Portland until a programmatic, comprehensive and area-wide Environmental Impact Statement is completed. (Resolution)

INTRODUCED BY Commissioner/Auditor: **Comm Fritz**	CLERK USE: DATE FILED SEP 18 2012
COMMISSIONER APPROVAL Mayor—Finance and Administration - Adams Position 1/Utilities - Fritz Tom Bryan Chief of Staff. Position 2/Works - Fish Position 3/Affairs - Saltzman Position 4/Safety - Leonard	LaVonne Griffin-Valade Auditor of the City of Portland By: _____ Deputy **ACTION TAKEN:**
BUREAU APPROVAL Bureau: N/A Bureau Head:	
Prepared by: Milena Malone Date Prepared: September 10, 2012	
Financial Impact & Public Involvement Statement Completed ☒ Amends Budget ☐	
Portland Policy Document If "Yes" requires City Policy paragraph stated in document. Yes ☒ No ☐	
Council Meeting Date **September 19, 2012**	
City Attorney Approval: required for contract, code, easement, franchise, charter, Comp Plan	

AGENDA

TIME CERTAIN ☒
Start time: 2:00 pm

Total amount of time needed: 60 min
(for presentation, testimony and discussion)

CONSENT ☐

REGULAR ☐
Total amount of time needed: _____
(for presentation, testimony and discussion)

FOUR-FIFTHS AGENDA	COMMISSIONERS VOTED AS FOLLOWS:	YEAS	NAYS
1. Fritz	1. Fritz	✓	
2. Fish	2. Fish	✓	
3. Saltzman	3. Saltzman	—	—
4. Leonard	4. Leonard	—	—
Adams	Adams	✓	

RESOLUTION No. 37168 As Amended

Oppose expansion of infrastructure whose primary purpose is transporting or storing fossil fuels in or through Portland or adjacent waterways (Resolution)

WHEREAS, the rapid development of fossil fuel resources in the western U.S. and Canada has resulted in numerous facility and infrastructure projects proposed to transport coal, diluted bitumen, natural gas, propane or other fossil fuels through the West Coast; and

WHEREAS, fossil fuels pose risks to safety, health, and livability, including mobility of people, other freight, and other commercial vehicles; and

WHEREAS, fossil fuel infrastructure poses considerable risks in the event of a major earthquake; and

WHEREAS, the extraction and combustion of fossil fuels are significant sources of greenhouse gas emissions and major contributors to climate change and pollution; and

WHEREAS, coal contains toxic heavy metals, including mercury, arsenic and lead, and exposure to these toxic heavy metals is linked to cancer, birth defects and other health problems; and

WHEREAS, transportation of coal using open top rail cars results in significant volumes of materials escaping during transit, exposing communities to toxic heavy metals in coal dust and particulates at levels potentially harmful to adjacent communities, workers, wildlife and nature; and

WHEREAS, crude oil, including oil derived from the Bakken shale reservoir, is known to be volatile, highly flammable and to contain elevated levels of benzene, a potent carcinogen; and

WHEREAS, extraction of fossil fuels through fracking and tar sands processing, which has become widespread throughout the Western United States and Canada, has damaging impacts to human and environmental health and fracking increases the potential for earthquakes; and

WHEREAS, transporting crude oil, coal and other fossil fuels into Oregon involves traversing challenging mountain passes, areas laced with significant earthquake faults and numerous older unsafe bridges lacking appropriate infrastructure maintenance or upgrades, significantly increasing the risks of serious accidents; and

WHEREAS, given the record of crude oil and coal or other fossil fuel transport accidents, such as Lac Mégantic in 2013, the 1999 Bellingham pipeline leak or a coal train derailment, an event could have catastrophic effects if it occurred in any of Oregon's populated areas; and

WHEREAS, the risks posed by the transportation of fossil fuels through the Columbia Gorge are inconsistent with the Gorge's designation as a National Scenic Area; and

WHEREAS, historically, when environmental accidents do occur, litigation over damages is drawn out over years, deflecting blame while undercutting timely assistance to affected communities; and

WHEREAS, tribal communities in Oregon and Washington have expressed concerns about the safety risks of fossil fuel infrastructure and the related threats to human health, cultural heritage, and environmental quality; and

WHEREAS, economic opportunities presented by expanding fossil fuel infrastructure are modest, with few jobs and little value added when compared to the related environmental costs; and

WHEREAS, local, regional and global economies are transitioning to low-carbon energy sources, and West Coast businesses are leaders in providing energy efficiency and renewable energy technologies and services; and

WHEREAS, the future of the fossil fuel industry is questionable given global action to reduce greenhouse gas emissions; and

WHEREAS, climate change, if unchecked, will continue impact human health, natural systems, and infrastructure, creating new costs for individuals, businesses, and governments; and

WHEREAS, the City's *2015 Climate Action Plan* (adopted by Resolution 37135) identifies the need to establish a "fossil fuel export policy that considers lifecycle emissions, safety, economics, neighborhood livability and environmental impacts" (*Climate Action Plan*, action 3G, page 69); and

WHEREAS, the City and Multnomah County, working together with many individuals, and community and business partners, have reduced local carbon emissions 14 percent since 1990 while adding population and jobs; on a per person basis, carbon emissions have decreased 35 percent since 1990; and

WHEREAS, the *2015 Climate Action Plan* commits the City to continue to advance policy and programs to reduce local fossil fuel use both in the City's own operations and through community-wide initiatives; and

WHEREAS, in September 2015, the Council added fossil fuel companies to the City's Corporate Securities Do-Not-Buy List, committing the City to hold no financial stake in the 200 largest fossil fuel firms. Resolution 37153; and

WHEREAS, 27 Oregon and Washington communities have passed resolutions addressing fossil fuel transport and export, and hundreds of public officials, including the governors of Oregon and Washington, state and federal agencies, tribes, health organizations, religious leaders and other community leaders, have recognized the harms presented by fossil fuels to the environment and Northwest communities; and

WHEREAS, in 2012, the Council expressed opposition to coal trains traveling through Portland until a programmatic, comprehensive and area-wide Environmental Impact Statement and comprehensive Health Impact Assessment are completed. Resolutions 36959 and 36962; and

WHEREAS, the City is continuing to work with utilities to reduce coal and other fossil fuels in Portland's electricity supply;

NOW, THEREFORE, BE IT RESOLVED, that the City Council will actively oppose expansion of infrastructure whose primary purpose is transporting or storing fossil fuels in or through Portland or adjacent waterways; and

BE IT FURTHER RESOLVED, that this Resolution does not restrict:

1. improvements in the safety, or efficiency, seismic resilience, or operations of existing infrastructure;
2. the provision of service directly to end users;
3. development of emergency backup capacity;
4. infrastructure that enables recovery or re-processing of used petroleum products; or
5. infrastructure that will accelerate the transition to non-fossil fuel energy sources; and

BE IT FURTHER RESOLVED, that City bureaus are directed to examine existing laws, including those related to public health, safety, building, electrical, nuisance, and fire codes, and develop recommendations to address fossil fuels that strengthen public health and safety; and

BE IT FURTHER RESOLVED, that the Bureau of Planning and Sustainability is directed to develop proposed code changes for Council consideration to advance the policies set forth in this Resolution; and

BE IT FURTHER RESOLVED, that prior to any further Council action, the mayor shall schedule (1) a work session to review any proposed code changes and (2) an executive session to review the legal considerations of any proposed code changes; and

BE IT FURTHER RESOLVED, that the Bureau of Planning & Sustainability shall undertake an analysis of the economic impacts of any proposed Code changes to advance the policies set forth in this resolution, with a particular focus on potential impacts to local blue-collar jobs; and

BE IT FURTHER RESOLVED, that the City and applicable bureaus shall seek and identify opportunities to invest in Portland's 'human infrastructure' by supporting programs to retrain our workforce as the city transitions to a clean energy economy; and

BE IT FURTHER RESOLVED, that the City shall consult with its Tribal Government Partners, the State of Oregon, local governments, and other key stakeholder including labor, business, environment, neighborhoods and communities of color in advancing this policy; and

BE IT FURTHER RESOLVED, notwithstanding anything in this resolution, the Council will exercise its duty as a quasi-judicial land use decision making body in an impartial manner consistent with City Code and Oregon law.

BE IT FURTHER RESOLVED, this resolution is binding City policy.

Adopted by the Council: NOV 12 2015

Mayor Charlie Hales
Prepared by: M. Armstrong, BPS
Date Prepared: October 23, 2015

Mary Hull Caballero
Auditor of the City of Portland
By Susan Parsons
Deputy

Oregon and Washington Physicians for Social Responsibility (3327)

~~1157~~ 1179

Agenda No.
RESOLUTION NO. 37168 As Amended
Title

Oppose expansion of infrastructure whose primary purpose is transporting or storing fossil fuels in or through Portland or adjacent waterways (Resolution)

INTRODUCED BY Commissioner/Auditor: **Charlie Hales** / Amanda Fritz	CLERK USE: DATE FILED OCT 27 2015
COMMISSIONER APPROVAL	Mary Hull Caballero Auditor of the City of Portland
Mayor—Finance and Administration - Hales	
Position 1/Utilities - Fritz Amanda Fritz	By: _____ Deputy
Position 2/Works - Fish	
Position 3/Affairs - Saltzman	
Position 4/Safety - Novick	**ACTION TAKEN:** NOV 04 2015 **CONTINUED TO** NOV 12 2015 2 P.M. TIME CERTAIN
BUREAU APPROVAL	
Bureau: BPS Bureau Head: Susan Anderson Susan Anderson	
Prepared by: Michael Armstrong Date Prepared: October 23, 2015	
Impact Statement Completed ☒ Amends Budget ☐	
Portland Policy Document If "Yes" requires City Policy paragraph stated in document. Yes ☒ No ☐	
City Auditor Office Approval: required for Code Ordinances	
City Attorney Approval: required for contract, code. easement, franchise, charter, Comp Plan	
Council Meeting Date: **November 4, 2015**	

AGENDA
TIME CERTAIN ☒ **Start time: 2:00 pm** **Total amount of time needed: 2 hours** (for presentation, testimony and discussion)
CONSENT ☐
REGULAR ☒ **Total amount of time needed: 2 hours** (for presentation, testimony and discussion)

FOUR-FIFTHS AGENDA	COMMISSIONERS VOTED AS FOLLOWS:	YEAS	NAYS
1. Fritz	1. Fritz	✓	
2. Fish	2. Fish	✓	
3. Saltzman	3. Saltzman	✓	
4. Novick	4. Novick	✓	
Hales	Hales	✓	

Environment Justice Task Force

900 Court Street NE, Salem, OR 97301

July, 2012

Governor John Kitzhaber
160 State Capitol
900 Court Street
Salem, Oregon 97301-4047

Governor Kitzhaber,

The Environmental Justice Task Force applauds your efforts to explore and understand the environmental impacts of coal transports from Powder River Basin through Oregon. We have heard comments from community members expressing concern about the potential impacts of coal export proposals on low income, communities of color, and other vulnerable community members in our state. We share these health and safety concerns. For that reason, the Environmental Justice Task Force urges you to fully consider a health impact assessment/analysis before proceeding with permits for coal transport and exports.

The Task Force is concerned that diesel emissions and coal dust associated with coal transport would exacerbate the already disproportionate environmental burdens and health inequities experienced by low-income and minority neighborhoods. Proposals on the table are likely to affect tribal lands, minority communities in North and Northeast Portland, and Latino and low income communities in West Eugene.

I am sure you are well aware of the potential for diesel particulate matter to impair pulmonary development, severity of asthma attacks (particularly in children), and increased risk of stroke, heart attacks and cancer. Coal dust is also linked to bronchitis, emphysema and other cardiovascular ailments. The potential for heavy metals leaching from fugitive coal dust is also a concern to be considered. Other impacts of coal transport, including noise, safety at crossings, and traffic delays, have the potential to adversely affect the health of communities along the transportation corridors. Increased coal burning in Asia also contributes to smog, soot, mercury emissions and greenhouse gases that influence our ability to protect the health of Oregon communities.

The Environmental Justice Task Force urges you to fully consider a health impact assessment/analysis before proceeding with permits for coal transport and exports. While this analysis will take time and resources, it is ultimately in the interest of all communities in the state, and particular for those who are most vulnerable to the health and environmental impacts, that we clearly understand the health risks.

On behalf of the EJ Task Force, I thank you for your continued support and advocacy to ensure environmental justice: a safe and healthy environment for every Oregonian to live, work, play, learn and practice spirituality.

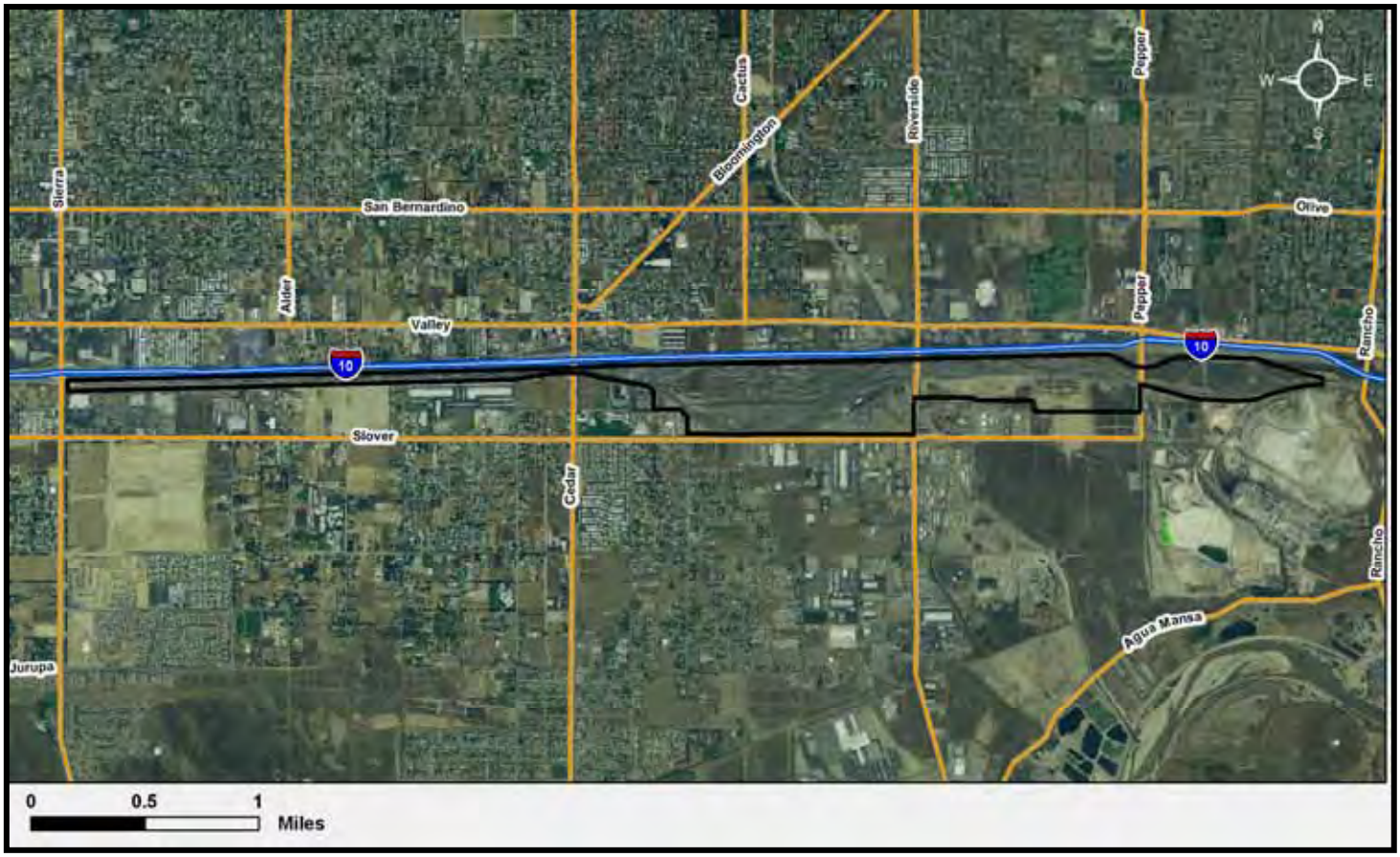
Sincerely,

Benjamin Duncan

Benjamin Duncan
Chair, Environmental Justice Task Force

California Environmental Protection Agency
Air Resources Board

Health Risk Assessment for the Union Pacific Railroad Colton Railyard



Stationary Source Division
April 18, 2008

California Environmental Protection Agency
Air Resources Board

Health Risk Assessment For the Union Pacific Railroad Colton Railyard

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The staff of the Air Resources Board has prepared this report. Publication does not signify that the contents reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Acknowledgements

Air Resources Board staff extends its appreciation to the representatives of Union Pacific Railroad and their consultants, Sierra Research and Air Quality Management Consulting, for preparing the railyard emissions inventories and air dispersion modeling simulations.

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Lanny Schmid, Jon Germer, Brock Nelson, James Diel, Duffy Exon.

Sierra Research:
Gary Rubenstein, Brenda Douglass, Eric Walther, Ph.D.

Air Quality Management Consulting:
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I. INTRODUCTION

The California Air Resources Board (ARB or Board) conducted a health risk assessment study to evaluate the health impacts associated with toxic air contaminants emitted in and around the Union Pacific Railroad's (UP) Colton railyard located in Bloomington, California. The UP Colton Railyard is located at 19100 Slover Avenue in Bloomington, California. The study focused on the railyard property emissions from locomotives, on-road trucks, and off-road vehicles and equipment used to move bulk cargo such as forklifts. Also evaluated were mobile and stationary sources with significant emissions within a one-mile distance from the railyard. This information was used to evaluate the potential health risks associated with diesel particulate matter emissions to those living nearby the railyard.

A. Why ARB is concerned about diesel PM emissions?

In 1998, following a 10-year scientific assessment process, ARB identified particulate matter from diesel exhaust (diesel PM) as a toxic air contaminant based on its potential to cause cancer and other adverse health problems, including respiratory illnesses, and increased risk of heart disease. Subsequent research has shown that diesel PM contributes to premature death* (ARB, 2002). Exposure to diesel PM is a health hazard, particularly to children, whose lungs are still developing and the elderly, who may have other serious health problems. In addition, the diesel PM particles are very small. By mass, approximately 94% of these particles are less than 2.5 microns in diameter ($PM_{2.5}$). Because of their tiny size, diesel PM particles are readily respirable and can penetrate deep into the lung and enter the bloodstream, carrying with them an array of toxins. Population-based studies in hundreds of cities in the U.S. and around the world demonstrate a strong link between elevated PM levels and premature deaths (Pope et al., 1995, 2002 and 2004; Krewski et al., 2000), increased hospitalizations for respiratory and cardiovascular causes, asthma and other lower respiratory symptoms, acute bronchitis, work loss days, and minor restricted activity days (ARB, 2006e).

Diesel PM emissions are the dominant toxic air contaminants in and around a railyard facility. Statewide, diesel PM accounts for about 70% of the estimated potential ambient air toxic cancer risks based on an analysis conducted by ARB staff in 2000 (ARB, 2000). That analysis also indicated that residents in the South Coast Air Basin (SCAB) had higher estimates of risk than elsewhere in the State. These findings are consistent with the preliminary findings reported in a recently released draft report entitled the "*Multiple Air Toxics Exposure Study in the South Coast Air Basin (SCAQMD, 2008)".* This study reported that diesel PM emissions have decreased, but these emissions are still the major contributor to air toxics risk in the SCAB, accounting for over 80% of the total risk from air toxics in the region. The higher percentage contribution over the previously reported 70% reflects the fact that there has been a proportionally greater reduction in other air toxics, such as benzene and 1, 3-butadiene.

* Premature Death: as defined by U.S. Centers for Disease Control and Prevention's Years of Potential Life Lost, any life ended before age 75 is considered premature death.

Based on scientific research findings and the dominance of diesel PM emissions, the health impacts in this railyard health risk assessment study primarily focus on the risks from the diesel PM emissions.

B. Why evaluate diesel PM emissions at the UP Colton Railyard?

In 2005, the ARB entered into a statewide railroad pollution reduction agreement (Agreement) with Union Pacific Railroad Company (UP) and BNSF Railway Company (BNSF) (ARB, 2005). This Agreement was developed to implement near term measures to reduce diesel PM emissions in and around California railyards by approximately 20 percent.

The Agreement requires that health risk assessments (HRAs) be prepared for each of the 17 major or designated railyards in the State. The Agreement requires the railyard HRAs to be prepared based on ARB's experience in preparing the UP Roseville Railyard HRA study in 2004, and the *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* that the ARB staff developed in 2006 (see http://www.arb.ca.gov/railyard/hra/hra.htm) (ARB, 2006d). The UP Colton Railyard is one of the designated railyards subject to the Agreement and the HRA requirements.

C. What are Health Risk Assessments (HRAs)?

An exposure assessment is an analysis of the amount (i.e., concentration in the air) of a pollutant that a person is exposed to in a specific time period. This information is used in a risk assessment to evaluate the potential for an air pollutant to contribute to cancer or other health effects. A health risk assessment uses mathematical models to evaluate the health impacts from exposure to certain chemicals or toxic air contaminants released from a facility or found in the air. HRAs provide information to estimate potential long term cancer and non-cancer health risks. HRAs do not gather information or health data on specific individuals, but are estimates for the potential health impacts on a population at large.

A HRA consists of three major components: the air pollution emission inventory, the air dispersion modeling, and an assessment of associated health risks. The air pollution emission inventory provides an understanding of how the air toxics are generated and emitted. The air dispersion modeling takes the emission inventory and meteorology data such as temperature and wind speed/direction as its inputs, then uses a computer model to predict the distributions of air toxics in the air. Based on this information, an assessment of the potential health risks of the air toxics to an exposed population is performed. The results are expressed in a number of ways as summarized below.

- For potential cancer health effects, the risk is usually expressed as the number of chances in a population of a million people. The number may be stated as "10 in a million" or "10 chances per million". The methodology used to estimate the potential cancer risks is consistent with the Tier-1 analysis of *Air Toxics Hot Spots Program Risk Assessment Guidelines* (OEHHA, 2003). A Tier-1 analysis assumes that an individual is exposed to an annual average concentration of a given pollutant continuously for 70 years. The length of time that an individual is exposed to a given air concentration is proportional to the risk. Children, however, are impacted more during the childhood period. Exposure duration of 30 years or 9 years may also be evaluated as supplemental information to present the range of cancer risk based on residency period.

- For non-cancer health effects, a reference exposure level (REL)[†] is used to predict if there will be certain identified adverse health effects, such as lung irritation, liver damage, or birth defects. These adverse health effects may happen after chronic (long-term) or acute (short-term) exposure. To calculate a non-cancer health risk number, the reference exposure level is compared to the concentration that a person is exposed to and a "hazard index" (HI) is calculated. Typically, the greater the hazard index is above 1.0, the greater the potential for possible adverse health effects. If the hazard index is less than 1.0, then it is an indicator that adverse effects are less likely to happen.

- For premature deaths linked to diesel PM emissions in the South Coast Air Basin, ARB staff estimated about 1,300 premature deaths per year due to diesel exhaust exposure in 2000 (ARB Research Division, and Lloyd and Cackette, 2001). The total diesel PM emissions from all sources in the South Coast Air Basin are about 7,750 tons per year in 2005 (ARB, 2006a). Diesel PM emissions from the UP Colton Railyard are estimated at about 16.54 tons for the year 2005, which is about 0.21% of total air basin emissions. For comparison with another major source of diesel PM emissions in the South Coast Air Basin, the combined diesel PM emissions from the Ports of Los Angeles and Long Beach were estimated to be about 1,760 tons per year, which resulted in an estimated 29 premature deaths per year (ARB, 2006b).

[†] The Reference Exposure Level (REL) for diesel PM is essentially the U.S. EPA Reference Concentration first developed in the early 1990s based on histological changes in the lungs of rats. Since the identification of diesel PM as a Toxic Air Contaminant (TAC), California has evaluated the latest literature on particulate matter health effects to set the Ambient Air Quality Standard. Diesel PM is a component of particulate matter. Health effects from particulate matter in humans include illness and death from cardiovascular and respiratory disease, and exacerbation of asthma and other respiratory illnesses. Additionally, a body of literature has been published, largely after the identification of diesel PM as a TAC and adoption of the REL, which shows that diesel PM can enhance allergic responses in humans and animals. Thus, it should be noted that the REL does not reflect adverse impacts of particulate matter on cardiovascular and respiratory disease and deaths, exacerbation of asthma, and enhancement of allergic response.

The potential cancer risk from a given carcinogen estimated from the health risk assessment is expressed as the incremental number of potential cancer cases that could be developed per million people, assuming the population is exposed to the carcinogen at a constant annual average concentration over a presumed 70-year lifetime. For example, if the cancer risk were estimated to be 100 chances per million, the probability of an individual developing cancer would not be expected to exceed 100 chances in a million. If a population (e.g., one million people) were exposed to the same potential cancer risk (e.g., 100 chances per million), then statistics would predict that no more than 100 of those million people exposed would be likely to develop cancer from a lifetime of exposure (i.e., 70 years) due to diesel PM emissions from a facility.

The HRA is a complex process that is based on current knowledge and a number of assumptions. However, there is a certain extent of uncertainty associated with the process of risk assessment. The uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in the assessments are often designed to be conservative on the side of health protection in order to avoid underestimation of risk to the public. As indicated by the OEHHA Guidelines, the Tier-1 evaluation is useful in comparing risks among a number of facilities and similar sources. Thus, the risk estimates should not be interpreted as a literal prediction of disease incidence in the affected communities but more as a tool for comparison of the relative risk between one facility and another. Therefore, the HRA results are best used to compare potential risks to target levels to determine the level of mitigation needed. They are also an effective tool for determining the impact a particular control strategy will have on reducing risks.

As soon as the HRAs are final, both the ARB and Railroads in cooperation with the SCAQMD staff, local citizens and others will begin a series of meetings to identify and implement measures to reduce emissions from railyard sources. Existing effects are detailed in Chapter III-C.

D. Who prepared the UP Colton Railyard HRA?

Under the Agreement, ARB worked with the affected local air quality management districts, communities, cities, counties, and the two railroads to develop two guideline documents for performing the health risk assessments. The two documents, entitled *ARB Rail Yard Emissions Inventory Methodology* (ARB, 2006c), and *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (ARB, 2006d), provide guidelines for the identification, modeling, and evaluation of the toxic air contaminants (TACs) from Designated Railyards throughout California. Using the guidelines, the railroads and their consultants (i.e., Sierra Research and Air Quality Management Consulting for the UP Colton Railyard) developed the emission inventories based on the year 2005 activities and performed the air dispersion modeling for all operations that occurred within each of the designated railyards. The base year of the analysis was 2005.

ARB staff was responsible for reviewing and approving the railroads' submittals, identifying significant sources of emissions near the railyards, modeling the impacts of those sources, and preparing the railyard health risk assessments. ARB staff was also responsible for releasing the draft HRAs to the public for comment and presenting them at community meetings. After reviewing public comments on the draft HRAs, ARB staff made revisions as necessary and appropriate, and is now releasing the HRAs in final form. Ultimately, the information derived from the railyard HRAs is to be used to help identify the most effective mitigation measures that could be implemented to further reduce railyard emissions and public health risks.

E. How is this report structured?

The next chapter provides a summary of the UP Colton Railyard operations, emissions, air dispersion modeling, and health risk assessment results. Following the summary, the third chapter presents the details of the UP Colton Railyard emission inventories. After that, the fourth chapter explains how the air dispersion modeling was conducted, and the fifth chapter provides the detailed health risk assessment for the UP Colton Railyard. The appendices present the technical supporting documents for the analyses discussed in the main body of the report.

II. SUMMARY

Below is a summary of the Union Pacific Railroad's (UP) Colton Railyard operations, emissions, air dispersion modeling, and health risk assessment results.

A. General Description of the UP Colton Railyard

The Union Pacific (UP) Colton Railyard is located at 19100 Slover Avenue in Bloomington, California (see Figure II-1). The UP Colton Railyard covers a narrow area approximately 5.5 miles in length and 1/3 mile in width, at the widest part. The railyard is located adjacent to and directly south of the I-10 freeway. Land use north of the railyard and I-10 includes commercial, industrial, and residential areas. There are several truck distribution centers just north of the I-10. The nearest residential area is located at the west end of the UP Colton railyard, just north of the I-10, approximately 500 feet from the railyard boundary. Land use to the south of the railyard includes residential and industrial areas. There are a number of truck distribution centers and a bulk fuel storage plant in this area. The nearest residential area is located at the west end of the railyard about 350 feet from the Yard's southern boundary. Bloomington Junior High School is located south of the railyard, just east of Cedar Avenue. Land uses to the east and west include commercial and residential areas.

Facilities and equipment at the UP Colton Railyard include a locomotive shop, a locomotive service track, a locomotive wash area, a wheel shop, a sand tower, a railcar repair shop, diesel fuel storage tanks, various oil storage tanks, and a wastewater treatment plant.

B. What are the primary operations at the UP Colton Railyard?

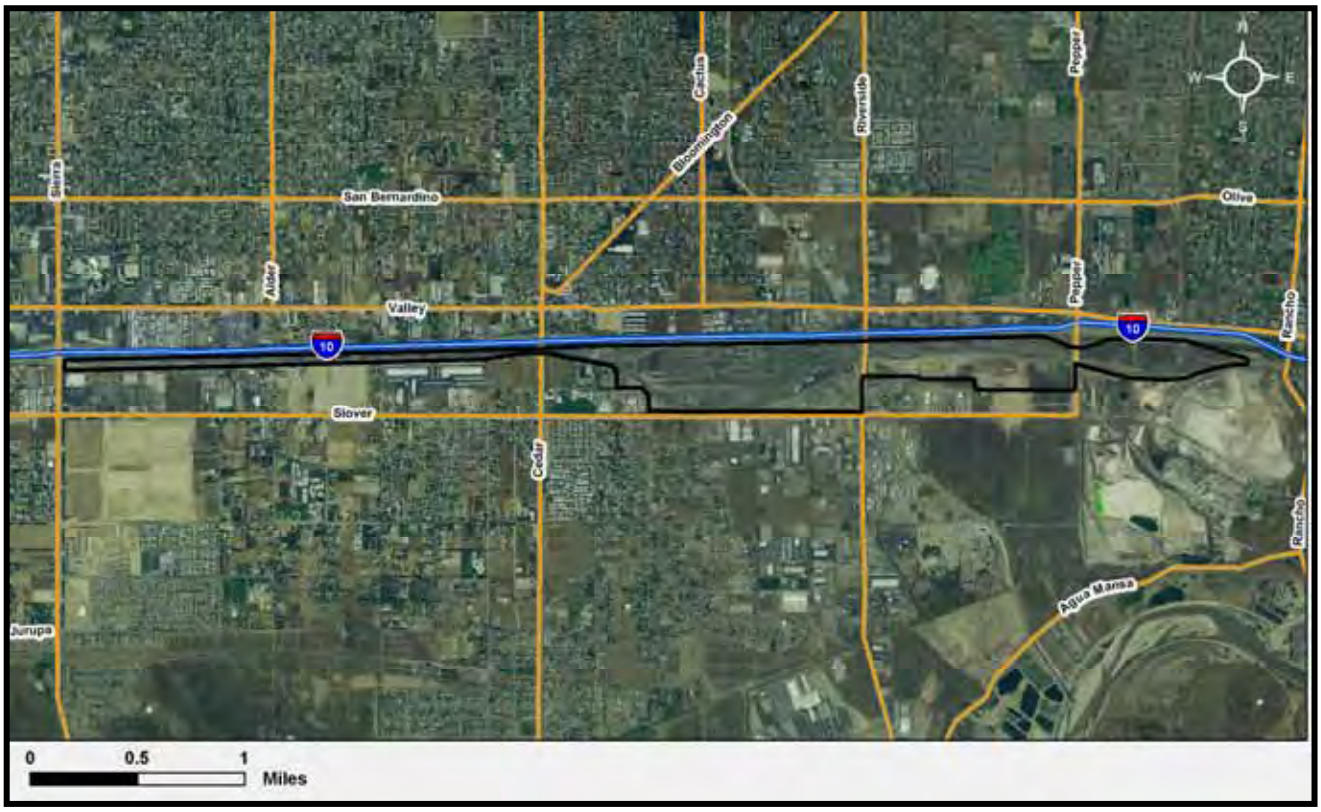
The UP Colton Railyard is a classification yard. The primary function of a classification railyard is to "break" arriving trains into sections based on their final destinations, and to build new trains that then depart for the desired destinations. This is accomplished by pushing the connected cars of an arriving train from the Receiving Yard over a "hump" (a raised section of track). Cars are decoupled at the top of the hump and gravity allows the cars roll into the "bowl." The bowl is a large area with a number of parallel tracks. A computer controls switching each car into the appropriate track within the bowl. Railyard switcher locomotives build new trains by pulling sections of cars out of the bowl, connecting them to others with the same destination(s), and moving them to the departure yard, thereby creating a new outbound train.

There is also a locomotive service facility at the railyard that performs both basic services and scheduled and unscheduled maintenance and load testing. In 2005, all service and maintenance was performed at the service track, while a new locomotive shop facility was constructed at the east end of the railyard.

Activities at the UP Colton Railyard include receiving inbound trains, building outbound trains, refueling locomotives, servicing locomotives, maintaining locomotives, washing locomotives, and performing sand tower operations. There are a number of tanks at the facility that are used to store liquid petroleum products such as diesel fuel, gasoline, lubricating oils, and recovered oil.

Within the railyard, the primary locomotive activities are associated with arriving and departing trains and servicing the locomotives that power these trains. Arriving and departing trains' locomotives are fueled in the locomotive service area after arrival, and are sent back into the railyard or to other railyards after service. A locomotive maintenance shop, built in 2006, also performs periodic and unscheduled maintenance on locomotives.

Figure II-1: UP Colton Railyard and Surrounding Areas

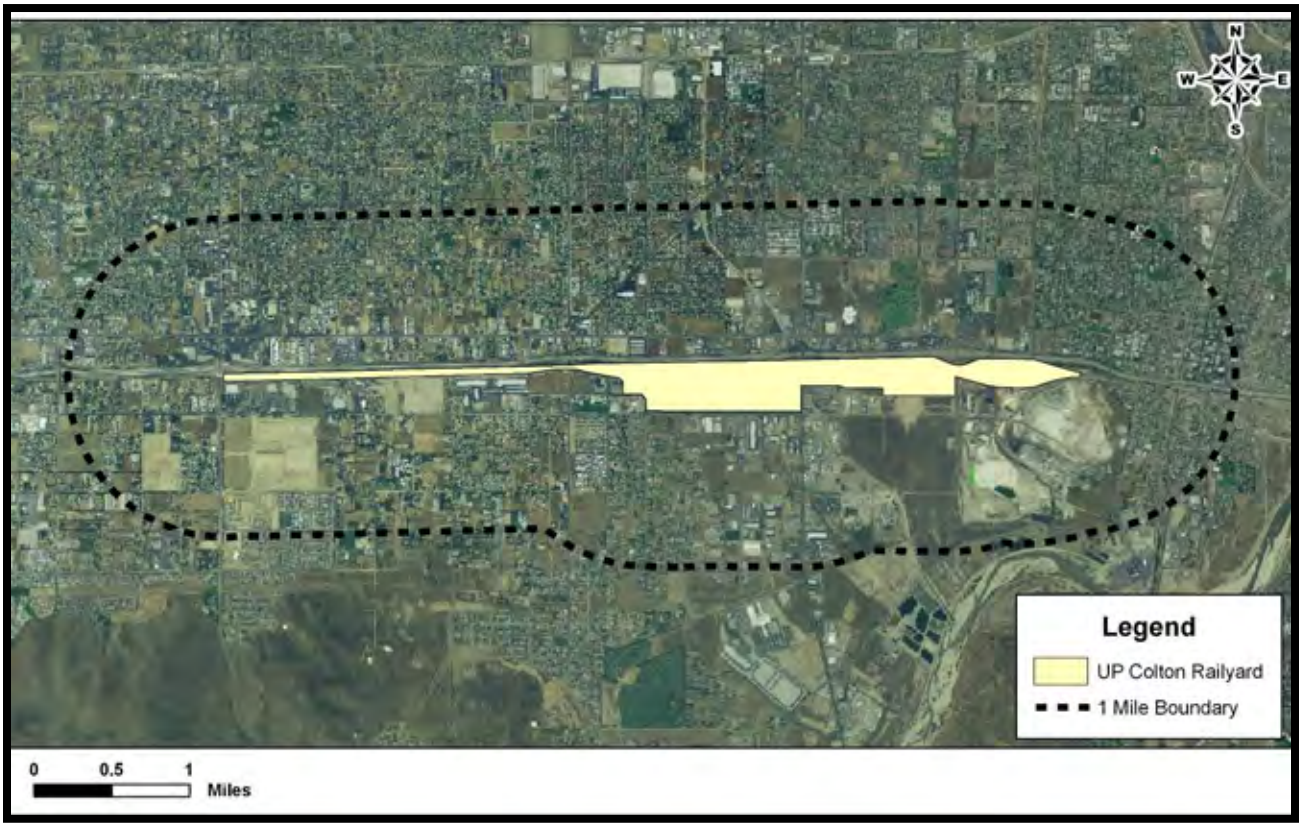


C. What are the diesel PM emissions in and around the UP Colton Railyard?

In 2005, the combined diesel PM emissions from the UP Colton Railyard (on-site emissions) and other significant emission sources within a one-mile distance from the boundary of the UP Colton railyard (off-site emissions) are estimated at about 60 tons per year (see Figure II-2). Estimated off-site diesel PM emissions from mobile sources (not generally related to activities at the railyard) are about 42 tons per year, or about 70% of the total combined on-site and off-site diesel PM emissions. Off-site stationary

sources contribute about 1.5 tons per year of the diesel PM emissions or about 2.5 % of the total combined emissions. The UP Colton Railyard diesel PM emissions are estimated at about 16.5 tons per year, which accounts for about 27.5% of the total combined on-site and off-site diesel PM emissions.

Figure II-2: Off-Site One Mile boundary of the UP Colton Railyard



To provide a perspective on the railyard diesel PM emissions, Table II-1 lists the estimated diesel PM emissions (for the year of 2005) for the eighteen railyards. The diesel PM emissions from the UP Colton Railyard rank sixth among the eighteen railyards.

Table II-1: Comparisons of diesel PM emissions (tons per year) from four major source categories within eighteen railyards.

Railyard	Locomotive	Cargo Handling Equipment	On-Road Trucks	Others (Off-Road Equipment, TRUs, Stationary Sources, etc.)	Total§
BNSF Barstow	27.1	0.03	0.04	0.75	27.9
BNSF San Bernardino	10.6	3.7	4.4	3.4	22.0
BNSF San Diego	1.6	N/A	0.007	0.04	1.7
UP ICTF/Dolores	9.8	4.4	7.5	2.0	23.7
UP Colton	16.3	N/A	0.2	0.05	16.5
UP Oakland	3.9	2.0	1.9	3.4	11.2
UP City of Industry	5.9	2.8	2.0	0.3	10.9
UP Roseville*	25.1*	N/A	N/A	N/A	25.1
BNSF Hobart	5.9	4.2	10.1	3.7	23.9
UP Commerce	4.9	4.8	2.0	0.4	12.1
UP LATC	3.2	2.7	1.0	0.5	7.3
UP Stockton	6.5	N/A	0.2	0.2	6.9
UP Mira Loma	4.4	N/A	0.2	0.2	4.9
BNSF Richmond	3.3	0.3	0.5	0.6	4.7
BNSF Stockton	3.6	N/A	N/A	0.02	3.6
BNSF Commerce Eastern	0.6	0.4	1.1	1.0	3.1
BNSF Sheila	2.2	N/A	N/A	0.4	2.7
BNSF Watson	1.9	N/A	<0.01	0.04	1.9
STATEWIDE RY TOTAL	136.8	25.33	31.15	17.0	210.1§
Statewide RY Percent	*65%*	*12%*	*15%*	*8%*	*100%*

*The UP Roseville Health Risk Assessment (ARB, 2004a) was based on 1999-2000 emission estimate, only locomotive diesel PM emissions were reported in that study. The actual emissions were estimated at a range of 22.1 to 25.1 tons per year.
§Numbers may not add precisely due to rounding.

1. *Railyard*

The UP Colton Railyard emission sources include, but are not limited to, locomotives, heavy-heavy duty (HHD) diesel-fueled delivery trucks, heavy equipment, fuel storage tanks, and an emergency generator. The facility operates 24 hours per day, 365 days per year. The emissions were calculated on a source-specific and facility-wide basis for the 2005 baseline year. The future growth in emissions at the UP Colton facility is not incorporated in the HRA emission inventory, but will be included as part of the mitigation emission reduction efforts. The methodology used to calculate the diesel PM and other toxic air contaminant (TAC) emissions is based on the *ARB Rail Yard Emissions Inventory Methodology* (ARB, 2006c). The locomotive emission factors used in the study are presented in Appendix D.

As indicated by Table II-2, locomotive operations within the railyard are responsible for an estimated 16.30 tons per year of diesel PM emissions (about 99% of the total on-site emissions). Of the emissions from locomotives, yard operations (primarily switch locomotives moving rail cars within the facility), contribute the largest amount of locomotive diesel PM emissions, at about 10.2 tons per year. Locomotive service and testing activities account for 2.6 tons per year, and line haul freight and pass-through trains contribute 3.5 tons per year of the diesel PM emissions. Diesel-fueled trucks and other vehicles contribute about 0.19 tons per year, or about 1% of the total on-site diesel PM emissions.

Diesel PM is not the only toxic air contaminant (TAC) emitted in the UP Colton Railyard. Relatively small amounts of gasoline toxic air contaminants are generated from the gasoline storage tanks (including isopentane, toluene, benzene, etc.). Some other toxic air contaminants, such as xylene, toluene and ethyl benzene are emitted from the wastewater treatment plant. The detailed emission inventories for these TACs are presented in the *Toxic Air Contaminant Emissions Inventory and Air Dispersion Modeling Report for the UP Colton Rail Yard, Bloomington, California* (Sierra Research, 2007). The total amount of these toxic air contaminants emissions is about 0.21 tons or 420 pounds per year, as compared to the 16.5 tons per year of the diesel PM emissions from the railyard.

In addition, adjusting these emissions on a cancer potency weighted basis for their toxic potential (see a similar analysis for off-site air toxic contaminants in Table II-3), these non-diesel PM toxic air contaminants emissions are about a factor of 80 less than a potency weighted emissions as compared to diesel PM (0.2 tons per year vs. 16.54 tons per year). Hence, only diesel PM emissions are presented in the on-site emission analysis.

Table II-2: UP Colton Railyard and Surrounding Areas (off-site)
Diesel PM Emissions in 2005

DIESEL PM EMISSION SOURCES	UP Colton Railyard		Off-site Emissions**	
	Tons/Year	Percentage	Tons/Year	Percentage
LOCOMOTIVES	**16.30**	**99%**	-	-
- Switch Locomotives (conducting yard operations)	10.2	62%	-	-
- Freight & Through Trains	3.5	21%	-	-
- Service/Testing/Refueling	2.6	16%	-	-
YARD TRUCKS	**0.19**	**1%**	-	-
OTHERS (Heavy Equipment and Emergency Generators)	**0.05**	**0.3%**	-	-
OFF-SITE MOBILE SOURCES (e.g., heavy duty trucks, etc.)	**-**	-	**42**	**97 %**
OFF-SITE STATIONARY SOURCES (e.g., public facilities, public utilities, etc.)	**-**	-	**1.5**	**3%**
TOTAL	**16.54***	**100%**	**43.5**	**100%**

* Numbers may not add precisely due to rounding.
** Emissions within the one-mile boundary. (Railyard emissions not include)

2. Surrounding Sources

ARB staff evaluated significant mobile and stationary sources of diesel PM emissions surrounding UP Colton Railyard. The Health Risk Assessment study for the UP Roseville Railyard (ARB, 2004a) indicated that cancer risk associated with on-site diesel PM emissions is substantially reduced beyond a one-mile distance from the railyard. Therefore, for the UP Colton Railyard, ARB staff analyzed the significant diesel PM emission sources within a one-mile distance from the railyard property boundary, where on-site emissions have significant health impacts.

ARB staff analyzed the significant off-site emission sources based on two categories: mobile and stationary. For the off-site mobile sources, the analysis focused on on-road heavy duty diesel trucks, as these are the primary sources of diesel PM emissions from the on-road vehicle fleet. ARB staff estimated mobile emissions based on roadway specific vehicle activity data and allocated them to individual roadway links. All roadway links within a one-mile distance from the UP Colton railyard boundary are included in the analysis. The estimates do not include the diesel PM emissions generated from other modes such as extended idling, starts, and off-road equipment outside the rail yards. Individual sources such as local truck distribution centers and warehouses were not evaluated due to insufficient activity data, but truck traffic related to these facilities is reflected in the roadway link traffic activities. Because the off-site mobile sources have only focused on the on-road diesel emissions, the exclusion of extended idling and off-road equipment may result in an underestimation of off-site mobile sources emissions.

Roadway link: is defined as a discrete section of roadway with unique estimates for the fleet specific population and average speed and is classified as a freeway, ramp, major arterial, minor arterial, collector, or centroid connector.

Emissions from off-site stationary source facilities are identified using the California Emission Inventory Development and Reporting System (CEIDARS) database, which contains information reported by the local air districts for stationary sources within their jurisdiction. The CEIDARS facilities whose locations fell within a one-mile distance from the boundary of the UP Colton railyard were selected. Diesel PM emissions are estimated from stationary internal combustion (IC) engines burning diesel fuel, and operating at stationary sources reported in CEIDARS.

Within a one-mile distance from the boundary of the UP Colton Railyard, off-site diesel PM emissions are predominantly generated by mobile sources, which emit around 42 tons per year, as indicated by Table II-2. The majority of the off-site diesel PM emissions are from diesel-fueled heavy duty trucks traveling on freeway I-10, and major local streets. There are some stationary sources that generate about 1.5 tons per year of diesel PM emissions. Three major stationary sources, California Portland Cement Company, Arrowhead Regional Medical Center, and General American Transportation Corporation (GATX) contribute about 1.46 tons per year of the off-site stationary sources diesel PM emissions. Diesel PM emissions from sources in the UP Colton Railyard and the sources within a one-mile distance from the boundary of the UP Colton railyard are summarized in Table II-2.

ARB staff also evaluated other toxic air contaminant (TACs) emissions around the UP Colton Railyard. According to ARB's *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (ARB, 2000), diesel PM, 1,3-butadiene, benzene, carbon tetrachloride, and formaldehyde are defined as the top five potential cancer risk contributors, based on ambient concentrations. These TACs account for 95% of the State's estimated potential cancer risk levels. This study also concluded that diesel PM contributes over 70% of the state's estimated potential cancer risk levels, which are significantly higher than other TACs (ARB, 2000). Among the off-site TACs emissions, the top 5 cancer risk contributors (without diesel PM) are estimated at about 9.0 tons per year.

The Office of Environmental Health Hazard Assessment (OEHHA) has estimated an inhalation cancer potency factor (CPF) for individual chemicals and some chemical mixtures such as whole diesel exhaust. Diesel PM contains many individual cancer causing chemicals. The individual cancer causing chemicals from diesel exhaust are not separately evaluated so as to avoid double counting. The four compounds listed here are given a weighting factor by comparing each compound's CPF to the diesel PM CPF. This factor is multiplied by the estimated emissions for that compound, which gives the cancer potency weighted toxic emission as shown in Table II-3. As can be seen in Table II-3, the potency weighted toxic emissions for these TACs are about 0.247 tons per year, which is substantially less than the diesel PM emissions.

Cancer potency factors (CPF) are expressed as 95% upper confidence limit of excess cancer cases occurring in an exposed population assuming continuous lifetime exposure to a substance at a dose of one milligram per kilogram of body weight, and are expressed in units of $(mg/kg\text{-}day)^{-1}$.

In addition, ARB staff evaluated the potential cancer risk levels caused by the use of gasoline in the South Coast Air Basin. Table II-4 shows the emissions of four major carcinogenic toxic air contaminants from South Coast Air Basin gasoline sources in 2005 (ARB, 2006a). As indicated in Table II-4, the cancer potency weighted emissions of these four toxic air contaminants from all types of gasoline sources are estimated at about 816 tons per year, or about 11% of diesel PM emissions in South Coast Air Basin. If only gasoline-powered vehicles are considered, the potency weighted emissions of these four TACs are estimated at about 438 tons per year, or about 6% of diesel PM emissions in the Basin. Hence, gasoline-powered vehicular sources are not included in the analysis.

Table II-3: Cancer Potency Weighted Toxic Air Contaminant Emissions from Significant Off-Site Stationary Sources Surrounding UP Colton Railyard

Compound	Cancer Potency Factor	Weighting Factor	Estimated Emission (tons/year)	Potency Weighted Toxic Emission (tons/year)
Diesel PM	1.1	1	43.5	**43.5**
1,3-Butadiene	0.6	0.55	0.021	**0.012**
Benzene	0.1	0.09	0.736	**0.066**
Carbon Tetrachloride‡	0.15	0.14	0.000056	**0.000**
Formaldehyde	0.021	0.02	8.48	**0. 169**
Total (non-diesel PM)	**-**	**-**	**9.24***	**0.247**

*: Numbers may not add precisely due to rounding.

‡ Very very small amount of carbon tetrachloride are emitted today. Ambient concentrations are highly influenced by past emissions due to the long atmospheric life time of this compound.

Table II-4: Emissions of Major Toxic Air Contaminants from Gasoline Sources in South Coast Air Basin

Compound	TACs Emissions (tons/year)			
	From All Sources	Potency Weighted**	From Gasoline Vehicles	Potency Weighted**
Diesel PM	7,746	**7,746**	-	-
1,3-Butadiene	695	**382**	420	**231**
Benzene	3,606	**325**	2,026	**182**
Formaldehyde	4,623	**92**	1,069	**21**
Acetaldehyde	1,743	**16**	314	**3**
Total (non-diesel PM)	10,668	**816**	3,829	**438**

**: Based on cancer potency weighting factors.

D. What are the potential cancer risks from the UP Colton Railyard?

As discussed previously, the ARB developed *Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (ARB, 2006d) to help ensure that the methodologies used in each railyard HRA meet the requirements in the ARB / Railroad Statewide Agreement. The railyard HRA follows *The Air Toxics Hot Spots Program Risk Assessment Guidelines* (OEHHA, 2003) published by the OEHHA, and is consistent with the methodologies used for the UP Roseville Railyard Study (ARB, 2004a).

The United States Environmental Protection Agency (U.S. EPA) recently approved a new state-of-science air dispersion model called AERMOD (**A**merican Meteorological Society/**E**PA **R**egulatory Model Improvement Committee **MOD**EL). This model is used in the ARB railyard health risk assessments. One of the critical inputs required for the air dispersion modeling is the meteorology, such as wind direction and wind speed. These parameters determine where and how the pollutants will be transported.

The UP Colton Railyard does not monitor meteorological variables on site. Wind speed, wind direction, temperature, and cloud cover data from the Ontario International Airport were used for this project. Although the Ontario International Airport is approximately 10 miles west of the UP Colton Railyard, the dominant effect of the elevated terrain an land sea effects near the coast was judged to be sufficiently important for airflow patterns that Ontario surface winds would be most representative of conditions at the railyard. The selection of Ontario International Airport for surface winds data was largely dependent on the limited availability of data from other stations for the same years for which upper air data were available. There are several SCAQMD surface stations in the general vicinity of the railyard for which historical (1981) data are available, but only in a form usable in AERMOD's predecessor, ISCST3. Based on the AERMOD meteorological data selection criteria, different meteorological stations around the UP Colton Railyard were evaluated and the data from the Ontario International Airport was selected for the final modeling.

> An **isopleth** is a line drawn on a map through all points of equal value of some measurable quantity; in this case, cancer risk.

The potential cancer risk levels associated with the estimated diesel PM emissions at the UP Colton Railyard are displayed by using isopleths. For this analysis, ARB staff elected to present the cancer risk isopleths focusing on risk levels of 10, 25, 50, 100, and 250 in a million. Figure II-3 and Figure II-4 present these isopleths. Figure II-3 focuses on the near source risk levels and Figure II-3 focuses on the more regional impacts. In each figure, the risk isopleths are overlaid onto a satellite image of the Bloomington area surrounding the UP Colton Railyard, to better illustrate the land use (residential, commercial, industrial, or mixed use) of these impacted areas.

The OEHHA Guidelines specify that, for health risk assessments, the cancer risk for the maximum exposure at the point of maximum impact be reported. The point of maximum impact (PMI), which is defined as a location or the receptor point with the highest cancer risk level outside of the facility boundary, with or without residential exposure, is predicted to be located at the northeast side of the railyard fence line (see Figure II-3). This is directly downwind of high emission density areas for the prevailing southwesterly wind, where locomotive activities (line haul, switchers, and locomotive service shop) generates about 50% of the facility-wide diesel PM emissions (see the emission allocation in Appendix E). The cancer risk at the PMI is estimated to be about 575 chances in a million. The land use in the vicinity of the PMI is primarily zoned as industrial use. However, there may be residents living in this zoned area. In the residential zoned area, the potential cancer risk of maximally exposed individual resident (MEIR) or maximum individual cancer risk (MICR) is estimated at about 150 chances in a million. As indicated by the Roseville Railyard Study (ARB, 2004a), the location of the PMI may vary depending upon the settings of the model inputs and parameters, such as meteorological data set or emission allocations in the railyard. Therefore, given the estimated emissions, modeling settings, and the assumptions applied to the risk assessment, there are great uncertainties associated with the estimation of point of maximum impact (PMI) and maximum individual cancer risk (MICR). These indications should not be interpreted as a literal prediction disease incidence but more as a tool for comparison. In addition, the estimated point of

maximum impact location and maximum individual cancer risk value may not be replicated by air monitoring.

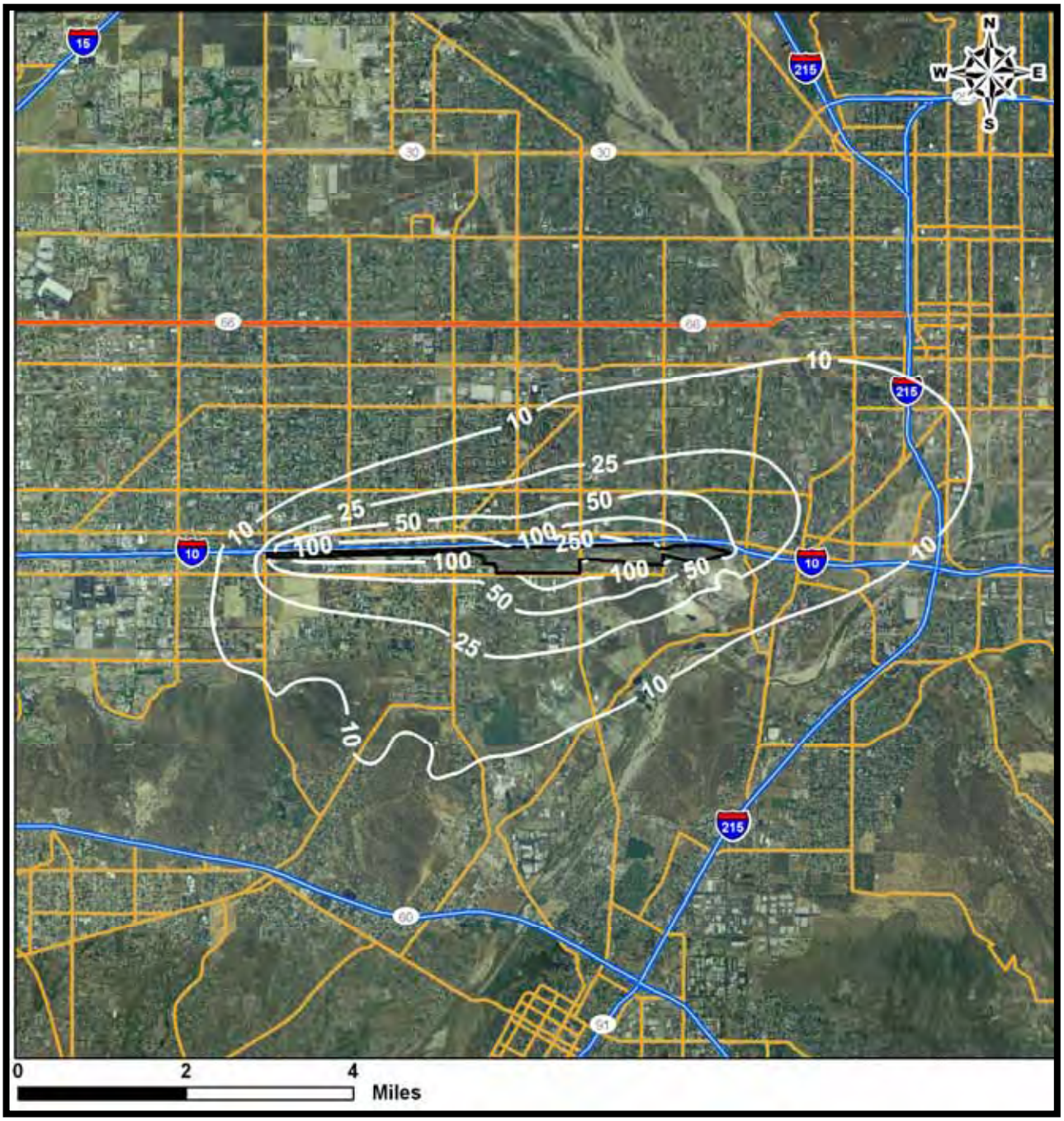
ARB staff also conducted a comparison of cancer risks estimated at the PMI versus MICR, and the differences of facility-wide diesel PM emissions between the UP and BNSF railyards. The ratios of cancer risks at the PMI or MICR to the diesel PM emissions do not suggest that one railroad's facilities have statistically higher cancer risks than the other railroad's or vice versa. Rather, the differences are primarily due to emission spatial distributions from individual operations among railyards.

As indicated by Figure II-3, the UP Colton Railyard can be divided into three areas, eastern, central and western; the area with the greatest impact has an estimated potential cancer risk of over 250 chances in a million, occurring in a very small area next to the northeastern side of the railyard fence line, right next to freeway I-10. The estimated cancer risk is about 250 chances per million within approximately 200 yards from the northeastern side of the railyard property boundary. At about 400 yards from the eastern side of the railyard boundary, the estimated cancer risks decrease to about 100 chances per million. As indicated by Figure II-4, the risks further decrease to 50 in a million within about half mile from the eastern side of the railyard boundary, then to 25 in a million approximately one mile from the railyard boundary. At about 2 miles from the eastern part of the railyard boundary, the estimated cancer risks are at 10 in a million or lower. For the central part of the railyard, the cancer risk is 100 in a million at about quarter a mile from the railyard boundary and at about half a mile the cancer risk is approximately 50 in a million. At about 1 mile the cancer risk is 25 in a million and at about 1.5 miles the cancer risk is 10 in a million or lower.

On the western side of the railyard, the area with the greatest impact has an estimated potential cancer risk of over 100 chances in a million. This area is located approximately 200 yards from the western part of the railyard boundary. At about a quarter a mile the estimated cancer risk decreases to 50 in a million and then at about half a mile the estimated cancer risk is 25 in a million or lower. At about 1 mile, the estimated the cancer risk decreases to 10 in a million.

Figure II-3: Estimated Near-Source Cancer Risks (chances per million people) from the UP Colton Railyard

Figure II-4: Estimated Regional Cancer Risks (chances per million people) from the UP Colton Railyard



The OEHHA Guidelines recommend 70-year lifetime exposure duration to evaluate the potential cancer risks for residents. Shorter exposure durations of 30 years and 9 years may also be evaluated for residents and school-age children, respectively, as a supplement. These three exposure durations – 70 years, 30 years, and 9 years – all assume exposure for 24 hours a day, and 7 days a week. It is important to note that children, for physiological as well as behavioral reasons, have higher rates of exposure

than adults on a per unit body weight basis (OEHHA, 2003).

To evaluate the potential cancer risks for off-site workers, the OEHHA Guidelines recommend that a 40-year exposure duration be used, assuming workers have a different breathing rate (149 L kg^{-1} day^{-1}) and exposure for an 8-hour workday, five days a week, 245 days a year.

Table II-5 shows the equivalent risk levels of 70- and 30-year exposure durations for exposed residents; and 40- and 9-year exposure durations for workers and school-age children, respectively. As Table II-5 shows, the 10 in a million isopleth line in Figure II-5 would become 4 in a million for exposed population with a shorter residency of 30 years, 2.5 in a million for exposed school-age children, and 2 in a million for off-site workers.

To conservatively communicate the risks, ARB staff presents the estimated cancer risk isopleths all based on 70-year resident exposure duration, even for those impacted industrial areas where no resident lives.

Table II-5: Equivalent Potential Cancer Risk Levels for 70-, 40-, 30- and 9-Year Exposure Durations

Exposure Duration (Years)	Equivalent Risk Levels (Chances in a Million)				
70	10	25	50	100	250
30	4	11	21	43	107
9*	2.5	6.3	12.5	25	62.5
40‡	2	5	10	20	50

* Exposure duration for school-aged children.
‡ Exposure duration for off-site workers.

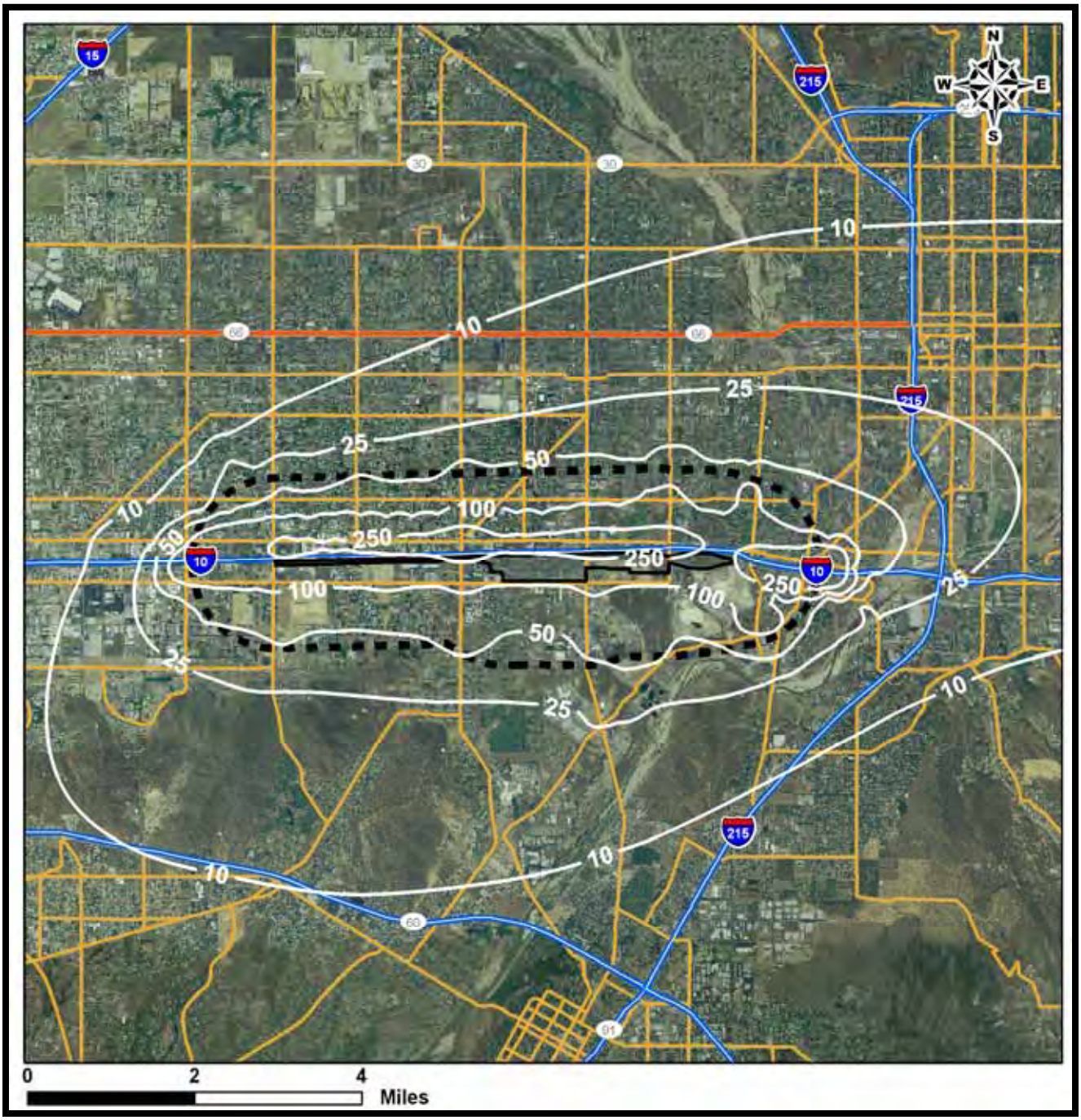
The more populated areas near the UP Colton Railyard are located to the west, north and southwest of the railyard. Based on the 2000 U.S. Census Bureau's data, the zone of impact of the estimated risks above 10 chances in a million levels encompasses approximately 17,000 acres where about 91,000 residents live. Table II-6 presents the exposed population and area coverage size for various impacted zones of cancer risks.

Table II-6: Estimated Impacted Areas and Exposed Population Associated with Different Cancer Risk Levels Estimated for UP Colton Railyard Diesel PM Emissions

Estimated Cancer Risk (chances per million)	Impacted Area (Acres)	Estimated Population Exposed
10 - 25	11,000	60,000
25-50	3,500	26,000
50-100	1,600	5,000
>100	635	320
>10	**17,000***	**91,000***

* Numbers may not add up due to rounding.

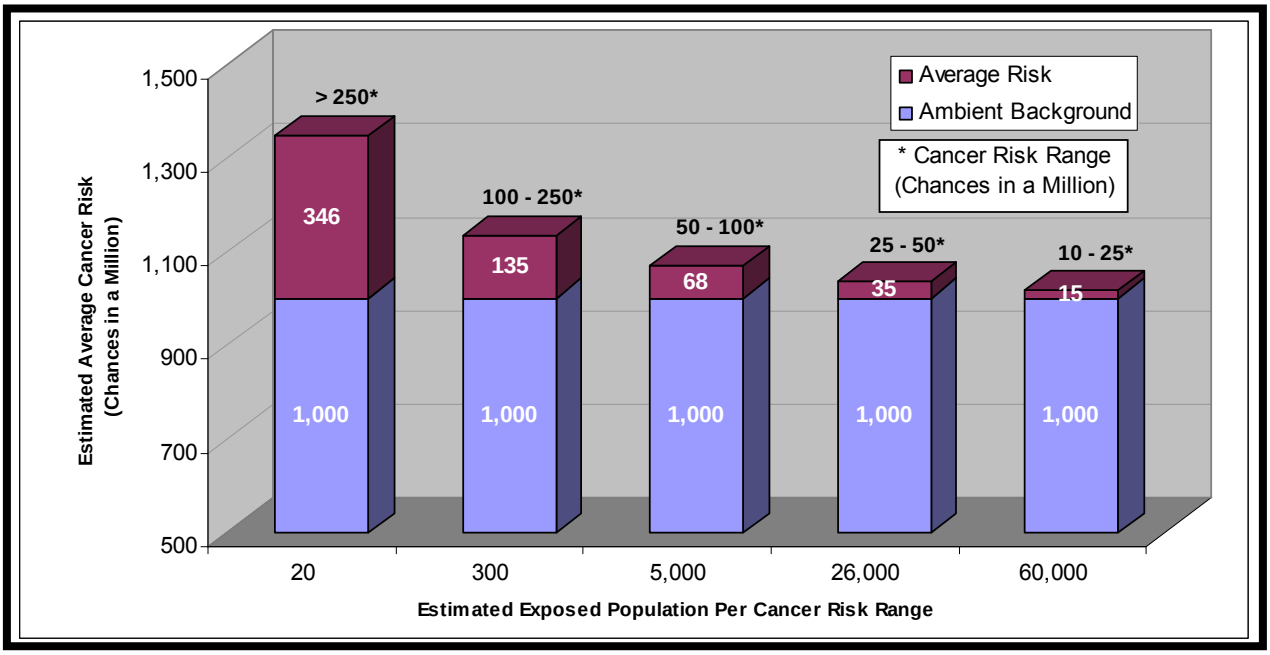
Figure II-5: Estimated Cancer Risk Levels from Off-site Diesel PM Emissions



It is important to understand that these risk levels represent the predicted risks (due to the UP Colton Railyard diesel PM emissions) above the existing background risk levels. For the broader South Coast Air Basin, the estimated average regional background risk level is estimated to be about 1,000 in a million caused by all toxic air pollutants in 2000 (ARB, 2006a). Figure II-6 provides a comparison of the predicted average potential cancer risks in various isopleths to the regional background risk level and estimated exposed population. For example, in the risk range greater than 250 chances in a million, the estimated average potential cancer risk above the regional background is

about 350 chances per million. Therefore, residents living in that area would have a potential cancer risk at about 1,350 in a million.

Figure II-6: Comparison of Estimated Potential Cancer Risks from the UP Colton Railyard and the Regional Background Risk Levels

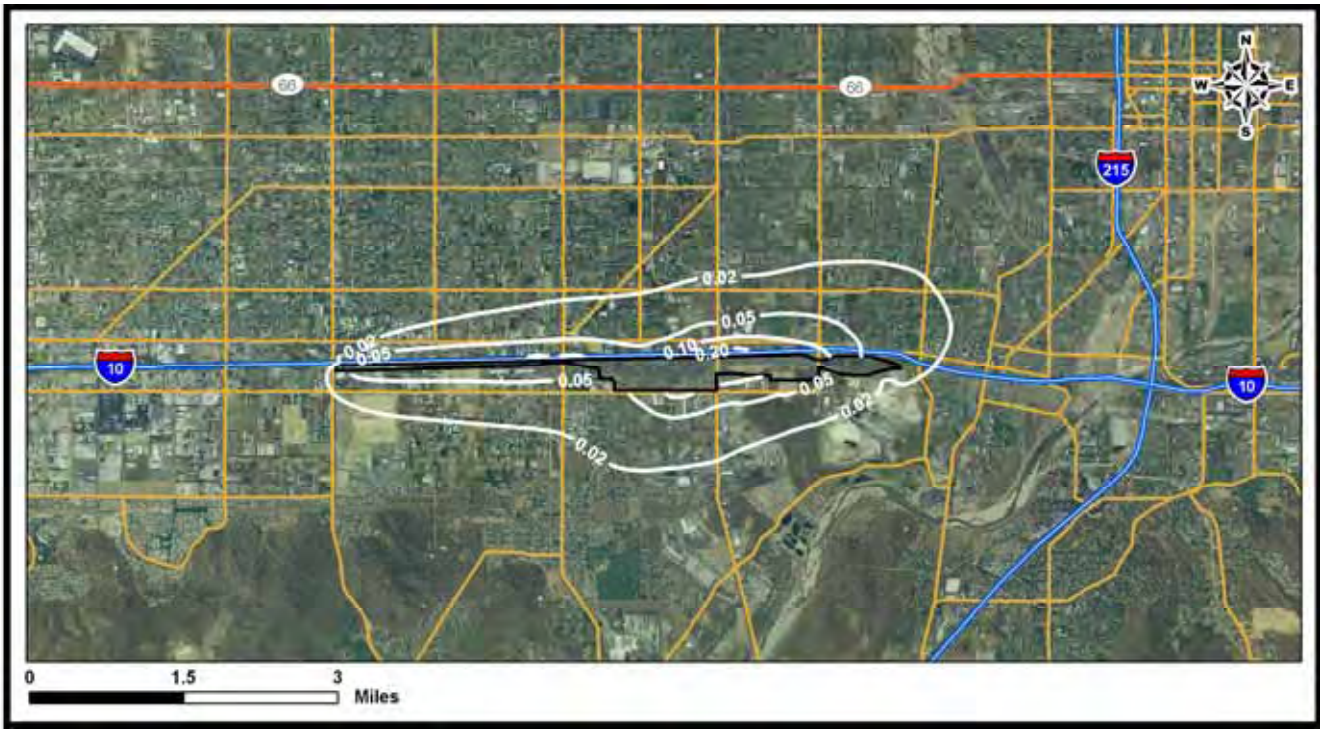


E. What are the estimated non-cancer risks near the UP Colton Railyard?

The potential non-cancer chronic risk health hazard index from diesel PM emissions from the UP Colton Railyard is estimated to range from 0.02 to 0.20 as shown in Figure II-7. According to OEHHA Guidelines (OEHHA, 2003), these levels indicate that the potential non-cancer chronic public health risks are less likely to happen.

Due to the uncertainties in the toxicological and epidemiological studies, diesel PM as a whole was not assigned a short-term acute REL. It is only the specific compounds of diesel exhaust (e.g., acrolein) that independently have potential acute effects (such as irritation of the eyes and respiratory tract), and an assigned acute REL. However, acrolein is a chemically reactive and unstable compound, and easily reacts with a variety of chemical compounds in the atmosphere. Compared to the other compounds in the diesel exhaust, the concentration of acrolein has a much lower chance of reaching a distant off-site receptor. More importantly, given the multitude of activities ongoing at facilities as complex as railyards, there is a much higher level of uncertainty associated with maximum hourly-specific emission data, which is essential to assess acute risk. Therefore, non-cancer acute risk is not addressed quantitatively in this study. From a risk management perspective, ARB staff believes it is reasonable to focus on diesel PM cancer risk because it is the predominant risk driver and the most effective parameter to evaluate risk reduction actions. Further, actions to reduce diesel PM will also reduce non-cancer risks.

Figure II-7: Estimated Non-Cancer Chronic Risk (indicated as Hazard Indices) associated With the Diesel PM Emissions from the UP Colton



F. What are the estimated health risks from off-site emissions?

ARB staff evaluated the health impacts from off-site pollution sources near the UP Colton Railyard facility using the U.S. EPA-approved AERMOD dispersion model. Specifically, off-site mobile and stationary diesel PM emission sources located within a one-mile distance from the boundary of the UP Colton was included. Diesel PM off-site emissions used in the off-site modeling runs consisted of about 42 tons per year from roadways and 1.5 tons per year from stationary facilities, representing off-site emissions for 2005. The diesel PM emissions from the UP Colton Railyard is not analyzed in the off-site air dispersion modeling. The estimated potential cancer risks associated with off-site diesel PM emissions are illustrated in Figure II-5. As indicated in Figure II-5, the zone of impacts of estimated cancer risks associated with off-site diesel PM emissions is significantly larger than that of the UP Colton Railyard. This result is expected because the diesel PM emissions from the significant off-site sources are equivalent to about three times the UP Colton Railyard diesel PM emissions.

Based on the 2000 U.S. Census Bureau's data, the zone of impact of the estimated potential cancer risks above 25 chances in a million levels associated with off-site diesel PM emissions encompasses approximately 20,000 acres where about 100,000 residents live. For comparison with the UP Colton Railyard health risks, the same level of potential cancer risks (25 chances in a million) covers about 6,000 acres with a population of approximately 30,000. Table II-7 presents the exposed population

and area coverage size for various impacted zones of cancer risks associated with off-site diesel PM emissions.

Table II-7: Estimated Impacted Areas and Exposed Population Associated with Different Cancer Risk Levels Estimated for Off-Site Diesel PM Emissions

Estimated Cancer Risk (chances per million)	Impacted Area (Acres)	Estimated Population Exposed
10 -25	26,000	133,800
25 -50	9,100	46,300
50-100	5,700	38,800
100-250	3,700	12,750
>250	1,300	3,900
>10	**46,000***	**235,550***

- Approximate estimates due to partial of these isopleths extend beyond the air dispersion model domain.
- Numbers may not add up due to rounding.

G. Can study estimates be verified by air monitoring?

Currently, there is no approved specific measurement technique for directly monitoring diesel PM emissions in the ambient air. This does not preclude the use of an ambient monitoring program to measure general air quality trends in a region. Since cancer risk is based on an annual average concentration, a minimum of a year of monitoring data would generally be needed.

H. What activities are underway to reduce diesel PM emissions and public health risks?

The Air Resources Board (ARB) has developed a comprehensive approach to reduce locomotive and railyard emissions through a combination of voluntary agreements, ARB and United States Environmental Protection Agency (U.S. EPA) regulations, funding programs, and early replacement of California's line haul and yard locomotive fleets. The information presented below summarizes California's key locomotive and rail yard air pollution control measures and strategies.

South Coast Locomotive NOx Fleet Average Agreement (1998): Signed in 1998 between ARB and both Union Pacific Railroad (UP) and BNSF Railway (BNSF), it requires the locomotive fleets that operate in the South Coast Air Quality Management District (SCAQMD) to meet, on average, U.S. EPA's Tier 2 locomotive emissions standards by 2010. Tier 2 locomotives became commercially available in 2005 and provide a 65 percent reduction in oxides of nitrogen (NOx) and 50 percent reduction in diesel particulate matter (PM) emissions. This Agreement will provide locomotive fleet benefits in southern California 20 years earlier than the rest of the country.

Statewide Railroad Agreement (2005): ARB and both UP and BNSF signed a voluntary statewide agreement in 2005 which does not change any federal, state, or local authorities to regulate railroads. The Agreement has resulted in measures that have achieved a 20 percent reduction in locomotive diesel PM emissions in and around rail yards since its adoption in June 2005. The measures in the Agreement include:

- Phasing-out of non-essential idling on all locomotives without idle reduction devices (60 minute limit – fully implemented);
- Installing idling reduction devices on 99% of the 450 California-based locomotives by June 30, 2008 (15 minute limit – 95 percent implemented);
- Identify and expeditiously repair locomotives with excessive smoke and ensure that at least 99 percent of the locomotives operating in California pass smoke inspections (fully implemented); and
- Requiring all locomotives that fuel in the state use at least 80 percent federal or California ultra low sulfur (15 parts per million) diesel fuel by January 1, 2007, (six years prior to federal requirement) (fully implemented);
- Preparing new health risk assessments for 16 major railyards, based on the UP Roseville Railyard health risk assessment (completed in 2004) and Office of Environmental Health Hazard Assessment (OEHHA) guidelines; (nine of 16 finalized in November 2007); and
- Identifying and implementing future feasible mitigation measures based on the results of the railyard health risk assessments.

ARB Diesel Fuel Regulations Extended to Intrastate Locomotives (2007): This regulation, approved in 2004, requires intrastate locomotives that operate 90 percent of the time in the state to use only California ultra low sulfur (15 parts per million) diesel fuel. CARB diesel's lower aromatics provide on average a six percent reduction in NOx and 14 percent reduction in diesel PM emissions as compared to U.S. EPA ultra low sulfur on-road diesel fuel. ARB staff estimates that there are 250 intrastate locomotives currently operating in the South Coast Air Basin, and CARB diesel fuel will reduce these locomotive emissions by up to 30 tons per year for diesel PM and 300 tons per year for NOx. The regulation took effect on January 1, 2007.

ARB Cargo Handling Equipment Regulations (2007): This regulation, approved in 2005, requires the control of emissions from more than 4,000 pieces of mobile cargo handling equipment, such as yard trucks and forklifts that operate at ports and intermodal rail yards. Implementation of this regulation will reduce diesel PM by approximately 40% in 2010 and 65% in 2015, and NOx emissions by approximately

25% in 2010 and 50% in 2015.This regulation is expected to reduce diesel PM and NOx emissions by up to 80 percent by 2020. The regulation took effect on January 1, 2007.

Heavy Duty Diesel New Trucks Regulations: ARB and the U.S. EPA both have adopted emission standards for 2007 and subsequent model year heavy-duty diesel engines. These standards represent a 90 percent reduction of NOx emissions, 72 percent reduction of non-methane hydrocarbon emissions, and a 90 percent reduction of PM emissions compared to the 2004 model-year emission standards. The ARB adopted similar emission standards and test procedures to reduce emissions from 2007 and subsequent model year heavy-duty diesel engines and vehicles. This stringent emission standards will reduce NO_x and diesel PM emissions statewide from on-road heavy diesel trucks by approximately 50 and 3 tons per day, respectively, in 2010; by 140 and 6 tons per day, respectively, in 2015; and by 210 and 8 tons per day, respectively, in 2020.

On-Road In-Use Truck Measure: The ARB is developing a regulation to reduce diesel PM, NO_x and green house gas emissions from on-road heavy-duty diesel-fueled vehicles. This measure will cover long and short haul truck-tractors, construction related trucks, wholesale and retail goods transport trucks, tanker trucks, package and household goods transport trucks, and most other diesel-powered trucks and buses with a gross vehicle weight rating of 14,000 pounds or greater (shuttle buses of all sizes will also be included). The goals of this effort are: (a) by 2014, emissions are to be no higher than a 2007 model year engine with a diesel particulate filter, and (b) by 2021, emissions are to be no higher than a 2010 model year engine. With the implementation of the proposed measure, California's diesel PM emissions from this sector could be reduced by about 70 percent and NOx emissions by up to 35 percent in 2014. This measure is scheduled for ARB Board consideration in October-2008.

In-Use Port and Railyard Truck Mitigation Strategies: The ARB developed a port truck fleet modernization program that will reduce diesel PM by nearly 86 percent by 2010, and NOx by nearly 56 percent by 2014, as compared to 2007 baseline. There are an estimated 20,000 drayage trucks operating at California's ports and intermodal railyards. These trucks are a significant source of air pollution, with about 3 tons per day of diesel PM and 61 tons per day of NOx in 2007. Drayage trucks also often operate in close proximity to communities. This regulation will result in significant reductions in exposure and potential cancer risks to residents that live near ports, railyards, and the major roadways. The ARB Board approved the regulation in December 2007.

ARB Tier 4 Off-Road Diesel-Fueled New Engine Emission Standards: In 2004, the ARB and U.S. EPA adopted a fourth phase of emission standards (Tier 4). New off-road engines are now required to meet after-treatment-based exhaust standards for particulate matter (PM) and NOx starting in 2011. The Tier 4 standards will achieve over a 90 percent reduction over current levels by 2020, putting off-road engines on a virtual emission par with on-road heavy duty engines.

Transport Refrigeration Unit (TRU) Air Toxics Control Measure (ATCM): This airborne toxics control measure is applicable to refrigeration systems powered by integral internal combustion engines designed to control the environment of temperature sensitive products that are transported in trucks, trailers, railcars, and shipping containers. Transport refrigeration units may be capable of both cooling and heating. Estimates show that diesel PM emissions for transport refrigeration units and transport refrigeration unit gen-set engines will be reduced by approximately 65% in 2010 and 92% in 2020. California's air quality will also experience benefits from reduced NOx and HC emissions. The transport refrigeration unit airborne toxics control measure is designed to use a phased approach over about 15 years to reduce the diesel PM emissions from in-use transport refrigeration unit and transport refrigeration unit generator set engines that operate in California. The TRU ATCM was approved on February 26, 2004 and became effective on December 10, 2004. Compliance dates for meeting in-use performance standards are phased in, beginning December 31, 2008, and extending out in time from there.

U.S. EPA Locomotive Emission Standards: Under the Federal Clean Air Act, U.S. EPA has sole authority to adopt and enforce locomotive emission standards. Under U.S. EPA's rules, this preemption also extends to the remanufacturing of existing locomotives. In April 2007, U.S. EPA released a proposed locomotive rulemaking that would reduce Tier 0 locomotive NOx emissions by 20 percent and Tier 0-3 remanufacture and new standards to reduce PM by 50 percent. The ARB is relying on U.S. EPA to expeditiously require the introduction of the next generation or Tier 4 locomotive emission standards that requires Tier 4 locomotives built with diesel particulate filters and selective catalytic reduction. Combined, these exhaust after-treatment devices are expected to provide up to a 90 percent reduction in NOx and PM emissions beginning in 2015-2017. The final U.S. EPA locomotive regulations are scheduled for approval in early 2008.

ARB Goods Movement Emission Reduction Plan (GMERP): Approved in 2006, this plan forecasts goods movement emissions growth and impacts. It contains a comprehensive list of proposed strategies to reduce emissions from ships, trains, and trucks and to maintain and improve upon air quality. The strategies in the plan, if fully implemented, would reduce locomotive NOx and diesel PM emissions by up to 85% by 2020.

California Yard Locomotive Replacement Program: One locomotive strategy being pursued is to replace California's older yard locomotives that operate in and around railyards statewide. Yard locomotives represent about five percent of the statewide locomotive NOx and diesel PM emissions, but often occur in railyards located in densely populated urban centers. Multiple non-road engine (gen-set) and electric-hybrid yard locomotives have demonstrated they can reduce NOx and diesel PM emissions by up to 90 percent as compared to existing locomotives. By 2008, UP had deployed 60 gen-set and 12 electric hybrid yard locomotives in southern California. BNSF has been operating four liquefied natural gas (LNG) yard locomotives in downtown Los Angeles since the mid-1990s. UP and BNSF have ordered more gen-set locomotives for use in northern California in 2008.

III. UP COLTON RAILYARD DIESEL PM EMISSIONS

This chapter provides a summary of the diesel PM emissions in and around the UP Colton Railyard.

For the year 2005, the combined diesel PM emissions from the UP Colton Railyard (on-site emissions) and significant non railyard emission sources within a one-mile distance from the boundary of the UP Colton railyard (off-site emissions) are estimated at about 60 tons per year. Estimated off-site diesel PM emissions from mobile sources (not generally related to activities at the railyard) are about 42 tons per year, or about 70% of the total combined on-site and off-site diesel PM emissions. Off-site stationary sources contribute 1.5 tons per year or 2.5% of the total combined on-site and off-site diesel PM emissions. The UP Colton Railyard diesel PM emissions are estimated at about 16.54 tons per year, which accounts for about 27.5% of the total combined on-site and off-site diesel PM emissions.

A. UP Colton Railyard Diesel PM Emissions Summary

The UP Colton Railyard activity data and emission inventories were provided by the Union Pacific Railroad and its consultants, Sierra Research and Air Quality Management Consulting. The methodology used to calculate the diesel PM and other toxic air contaminant (TAC) emissions is based on *ARB Rail Yard Emissions Inventory Methodology* (ARB, 2006c). Detailed calculation methodologies and resulting emission factors are included in the *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the UP Colton Rail Yard, Bloomington, California* (Sierra Research, 2007) submitted by Sierra Research (Sierra Research Report).

The UP Colton Railyard is a classification yard. The primary function of a classification yard is to “break” arriving trains into sections based on their final destinations, and to build new trains that then depart for the desired destinations. This is accomplished by pushing the connected cars of an arriving train from the Receiving Yard over a “hump” (a raised section of track). Cars are decoupled at the top of the hump and gravity allows the cars roll into the “bowl.” The bowl is a large area with a number of parallel tracks. Computer controls switching each car into the appropriate track within the bowl. Yard switcher locomotives build new trains by pulling sections of cars out of the bowl, connecting them to others with the same destination(s), and moving them to the departure Yard, thereby creating a new outbound train.

Activities at the UP Colton Railyard include receiving inbound trains, building outbound trains, refueling locomotives, servicing locomotives, maintaining locomotives, washing locomotives, and performing sand tower operations. There are a number of tanks at the facility that are used to store liquid petroleum products such as diesel fuel, gasoline, lubricating oils, and recovered oil.

Within the Yard, the primary locomotive activities are associated with arriving and departing trains and servicing the locomotives that power these trains. Arriving and departing trains' locomotives are fueled in the locomotive service area after arrival, and are sent back into the Yard or to other yards after service. A locomotive maintenance shop also performs periodic and unscheduled maintenance on locomotives.

Facilities and equipment at the UP Colton Yard include a locomotive shop, a locomotive service track, a locomotive wash area, a wheel shop, a sand tower, a railcar repair shop, Diesel fuel storage tanks, various oil storage tanks, and a wastewater treatment plant. On-site sources were separated into four operational areas based on specific activities to better characterize diesel PM emissions. These areas are summarized in Table III-1 and shown in Figure III-1. The detailed schematic and descriptions of the areas and activities are presented in the Sierra Research Report (Sierra Research, 2007).

Table III-1: UP Colton Railyard Activities

Area	Description
Receiving Yard	**Receiving inbound trains**
Hump, Bowl and Trim Tower	**Breaking down of the arriving trains, switching of the cars into the appropriate tracks, and building new trains**
Departure Yard	**Creating new outbound trains and their departure**
Servicing/Maintenance Area (Service Track, Wheel Shop, and Locomotive Shop)	**Maintenance and service area for locomotives (for Refueling, Servicing, washing and Sand Tower Operations).**

Note: Locomotive shop was not yet built in 2005, so all locomotive maintenance was performed at the service track

Using the data provided by UP and the methodology described in the Sierra Research Report, the diesel PM emissions from railyard sources are estimated to be approximately 16.54 tons per year. The diesel PM emissions from each activity are provided in Table III-2.

Table III-2: Summary of the UP Colton Railyard Diesel PM Emissions

Sources	Diesel PM Emissions (tons per year)	
	Total Diesel PM Emissions	Percent of Total
LOCOMOTIVES	**16.30**	**99%**
Switchers	*10.20*	*62%*
Line Hauls (Freight and Through Trains)	*3.50*	*21%*
Service and Maintenance	*2.60*	*16%*
DIESEL FUELED YARD TRUCKS*	**0.19**	**1%**
OTHERS (Heavy Equipment and Emergency Generator)	**0.05**	**0.3%**
TOTAL	**16.54****	**100%**

*: For further detail on railyard versus off-site on-road truck emissions, see Section C.
** Numbers may not add precisely due to rounding

Diesel PM is not the only toxic air contaminant (TAC) emitted in the UP Colton Railyard. A relatively small amount of gasoline toxic air contaminants is generated from the gasoline storage tanks (including isopentane, toluene, benzene, etc.). Some other toxic air contaminants, such as xylene, toluene and ethyl benzene are emitted from the wastewater treatment plant. The detailed emission inventories for these TACs are presented in the *Toxic Air Contaminant Emissions Inventory and Air Dispersion Modeling Report for the UP Colton Rail Yard, Bloomington , California* (Sierra Research, 2007). The total amount of these toxic air contaminants emissions is about 0.21 tons or 420 pounds per year, compared to the 16.5 tons per year of the diesel PM emissions in the railyard.

In addition, adjusting these emissions on a cancer potency weighted basis for their toxic potential (see a similar analysis for off-site air toxic contaminants in Table II-3), these non-diesel PM toxic air contaminants emissions are about a factor of 80 less than a potency weighted emissions as compared to diesel PM (0.21 tons per year vs. 16.54 tons per year). Hence, only diesel PM emissions are presented in the on-site emission analysis.

Figure III-1: The UP Colton Railyard Emission Source Locations

1. Locomotives

Locomotives are the largest diesel PM emission source at the UP Colton Railyard. Locomotives contribute about 16.30 tons per year, or about 99% of the total railyard diesel PM emissions.

The locomotive operations at the UP Colton Railyard are divided into three major categories: switching (i.e., moving rail cars within the yard and hump and bowl and trim operations), basic locomotive services (i.e., maintenance, testing, refueling etc.), and passing and arriving-departing line haul locomotives. The locomotive operations are further divided into activity subcategories to describe the emission modes and spatial allocation, such as locomotive movements, idling, etc. As shown in Table III-3 switch operations (hump and trim operations, and power moves in the yard) are the largest source of diesel PM emissions at the UP Colton railyard and account for about 10.2 tons per year or 63% of the locomotive diesel PM emissions and 62% of the total railyard diesel PM emissions. Trim operations account for about 5.28 tons per year, or 32% of the locomotive diesel PM emissions. Hump operations account for about 4.74 tons per year and power moves in the yard account for about 0.14 tons per year. Arriving, departing and through trains accounts for about 3.5 tons per year or 21%, and service and maintenance account for 2.6 tons per year, or 16% of the railyard diesel PM emissions.

Line haul locomotive activities include hauling through trains on the main line, pulling arriving trains into the Receiving Yard and departing trains out of the Departure Yard; and moving locomotives to and from the Service Track and Ready Track. Switching operations within the railyard include the use of 12 medium-horsepower switcher locomotives: two sets of three locomotives push inbound trains over the hump into the bowl, and three sets of two locomotives work the eastern end of the bowl and the departure yard to build new outbound trains. Locomotive servicing and maintenance activities are performed on both line haul and switcher locomotives, and include idling associated with refueling, sanding, oiling, and waiting to move to outbound trains. Additional periods of idling and operation at higher throttle settings occur during load test events that follow specific maintenance tasks. Temporal emission profiles were estimated for each activity based on hourly locomotive counts. The profiles developed account for hourly, daily and seasonal temporal variations and are reflected in the air dispersion modeling to capture operational variations.

According to UP, the UP interstate locomotives were fueled out of state before they entered the California borders. However, data for the detailed diesel deliveries within and outside of California were not available in 2005. When trains arrive at UP railyards, UP estimated a fuel mixture of about 90% CARB-EPA on-road to 10% non-road diesel fuel, based on traveling distance before entering California borders from the last refueling facility outside California. Trains arriving and terminating at California railyards (with the exception of local trains) used fuel produced outside of California and on arriving were assumed to have approximately 10% of their capacity of that fuel left in their tanks. On arrival, locomotives were refueled with California diesel fuel, resulting in a mixture of 90% CARB and 10% non-CARB fuel: this mixture is representative of fuel

on departing trains as well as trains undergoing load testing (if conducted at a specific railyard). For through trains by-passing UP railyards, an average composition of 50-50 split was applied to account for CARB-EPA and non-California diesel fuel used. Therefore, UP estimated different fuel sulfur levels based on the average fractions of California fuel being used as follows: 221 ppmw for yard operations, 463 ppmw for arriving and departing trains, 1,430 ppmw for through trains, and 2,639 ppmw for terminating trains.

The locomotive diesel PM emission factors used in this study are based on those of UP Roseville Railyard Study (ARB, 2004a), and have been adjusted according to 2005 fuel sulfur levels provided by UP. The adjustment factors are linear in sulfur content, allowing emission rates for a specific mixture of California and non-road fuels to be calculated as a weighted average of the emission rates for each of the fuels. Adjustment factors were developed and used to prepare tables of emission factors for two different fuel sulfur levels:

- **California Fuel.** In 2005, Chevron was Union Pacific Railroad's principal supplier of diesel fuel in California. Chevron's California refineries produced only one grade of low sulfur diesel for both CARB diesel and U.S. EPA on-road diesel fuels in 2005. Quarterly average sulfur content for these refineries ranged from 59 ppmw to 400 ppmw, with an average of 221 ppmw. The 221 ppmw sulfur content is assumed to be representative of California fuel used by UP (Sierra Research Report).

- **Non-Road Fuel.** In the U.S. EPA's 2004 regulatory impact analysis in support of regulation on non-road diesel engines, the estimated 49-state average fuel sulfur content is 2,639 ppmw (U.S. EPA, 2004c). The 2,639 ppmw sulfur content is assumed to be representative of non-road diesel fuel used by UP for fueling of locomotives outside of California (Sierra Research Report).

The benefit of the diesel fuel regulations is presented in detail in Section B.

The results are shown in two tables in Appendix D. Table III-3 presents the summary of diesel PM emissions from locomotive operation activities.

The ARB has developed an integrated approach to reduce statewide locomotive emissions through a combination of voluntary agreements, ARB and U.S. EPA regulations, incentive funding programs, and early replacement of California's line haul and yard locomotive fleets. ARB staff estimates that the replacement of the UP Colton's entire railyard (switch) locomotive with ultra low emitting locomotives could reduce those diesel PM emissions by up to 90 percent. This single measure could reduce UP Colton's total diesel PM emissions by up to 55 percent. The Locomotive NOx fleet average agreement (1998) provides a 65 percent reduction in oxides of nitrogen (NOx) and 50 percent reduction in diesel PM emissions in the South Coast Air Basin beginning in 2010. The detailed approach has been discussed in Chapter 2. Therefore, in the future, the UP Colton Railyard will benefit from these mitigation measures as diesel PM emissions from locomotives are gradually reduced as the locomotive fleets turn over.

Table III-3: Locomotive Diesel PM Emissions

Activity	Diesel PM Emissions in 2005	
	Tons Per Year	Percent of Total
Switching	**10.20***	**63%**
Trim Operations	5.28	32%
Hump Operations	4.74	29%
Power moves in the yard	0.14	1%
Line Haul Locomotives	**3.50**	**21%**
Freight Trains	2.45	15%
Through Trains and Power moves	0.51	3%
Local Trains	0.47	2%
Crew Changes	0.07	<1%
Service/Maintenance	**2.60**	**16%**
Service Idling	2.14	13%
Load Testing	0.44	3%
Service Movements	0.06	<1%
TOTAL	**16.30***	**100%**

- Numbers may not add up due to rounding off.

2. Yard Trucks or Diesel Fueled Trucks

UP operates a variety of on-road diesel-fueled trucks (Yard trucks) that are used for various activities in and around the Yard. These yard trucks are local vehicles used to perform support activities at the railyard. On-road diesel fueled trucks contribute about 1% of the total railyard diesel PM emissions at about 0.19 tons per year. As shown in Table III-4, 100% of the on-road truck diesel PM emissions come from diesel fueled yard trucks. Diesel PM emissions due to yard trucks at the UP Colton Railyard were estimated using emission factors from the draft EMFAC (version V2.23.7)model provided by ARB (2006c) and is based on average railyard travel distance.

An ARB regulation to modernize port and intermodal railyard drayage trucks is estimated to reduced diesel PM emissions by 86% by 2010, and NO_x by 56% by 2014, as compared to the 2007 baseline. In January of 2001, the U.S. EPA promulgated a Final Rule for emission standards for 2007 and subsequent model year heavy-duty diesel engines (66 FR 5002, January 18, 2001). These emission standards represent a 90 percent reduction of oxides of nitrogen emissions, 72 percent reduction of non-methane hydrocarbon emissions, and 90 percent reduction of particulate matter emissions compared to the 2004 model year emission standards. Therefore, starting in

2007, the UP Colton Railyard will benefit from these mitigation measures, with diesel PM emissions from heavy-duty diesel-fueled trucks being gradually reduced as the truck fleets turn over.

Table III-4: UP Colton Railyard On-Road Truck Diesel PM Emissions

Source	Diesel PM Emissions (tons per year)		
	Traveling	Idling	Total
Diesel-Fueled Yard Trucks	0.19	0.002	0.19
TOTAL	0.19	0.01	0.19
Percent of Total On-Road Truck Emissions	100%	0%	100%

* Numbers may not add precisely due to rounding.

3. Heavy Equipment and Emergency Generator

Diesel-fueled heavy equipment is used in yard operations at the UP Colton Railyard. The heavy equipment is used for non-cargo-related activities at the railyard, such as locomotive maintenance, handling of parts and company material, derailments, etc. The diesel PM emissions from heavy equipment was estimated at about 0.05 tons in year 2005, equivalent to about 0.3% of total railyard diesel PM emissions. A detailed methodology is discussed in the Sierra Research Report. An emergency generator is located in the bowl area of the UP Colton Yard to provide emergency lighting when electrical service from the local power provider is disrupted. The generator is a 50 horsepower, diesel-fueled unit. Emissions from the emergency generator at the Yard are based on the rated capacity of the unit (size) and the annual hours of operation. In 2005, the generator was operated about 20 hours. The diesel PM emissions from the emergency generator was estimated as 0.001 tons per year.

B. Current Applicable Diesel Fuel Regulations and Their Benefits to the Railyards

1. California Air Resources Board (CARB) Diesel Fuel Specifications

The initial California diesel fuel specifications were approved by the Board in 1988 and limited sulfur and aromatic contents. The requirements for "CARB diesel," which became applicable in October 1993, consisted of two basic elements:

- A limit of 500 parts per million by weight (ppmw) on sulfur content to reduce emissions of both sulfur dioxide and directly emitted PM.
- A limit on aromatic hydrocarbon content of 10 volume percent for large refiners and 20 percent for small refiners to reduce emissions of both PM and NOx.

At a July 2003 hearing, the Board approved changes to the California diesel fuel regulations that, among other things, lowered the maximum allowable sulfur levels in California diesel fuel to 15 ppmw beginning in June 2006. Thus, ARB's specifications for sulfur and aromatic hydrocarbons are shown in Table III-5.

Table III-5: California Diesel Fuel Standards

Implementation Date	Maximum Sulfur Level (ppmw)	Aromatics Level (% by volume)	Cetane Index
1993	500	10	N/A
2006	15	10	N/A

The regulation limiting aromatic hydrocarbons also includes a provision that enables producers and importers to comply with the regulation by qualifying a set of alternative specifications of their own choosing. The alternative formulation must be shown, through emissions testing, to provide emission benefits equivalent to that obtained with a 10 percent aromatic standard (or in the case of small refiners, the 20 percent standard). Most refiners have taken advantage of the regulation's flexibility to produce alternative diesel formulations that provide the required emission reduction benefits.

2. U.S. EPA On-Road Diesel Fuel Specifications

The United States Environmental Protection Agency (U.S. EPA) has also established separate diesel fuel specifications for on-road diesel fuel and off-road (non-road) diesel fuel. The initial U.S. EPA diesel fuel standards were applicable in October 1993. The U.S. EPA regulations prohibited the sale or supply of diesel fuel for use in on-road motor vehicles, unless the diesel fuel had sulfur content no greater than 500 ppmw. In addition, the regulation required on-road motor-vehicle diesel fuel to have a cetane index of at least 40 or have an aromatic hydrocarbon content of no greater than

35 percent by volume (vol. %). On-road motor-vehicle diesel fuel sold or supplied in the United States, except in Alaska, must comply with these requirements. Diesel fuel, not intended for on-road motor-vehicle use, must contain dye Solvent Red 164.

On January 18, 2001, the U.S. EPA published a final rule which specified that, beginning June 1, 2006, refiners must begin producing highway diesel fuel that meets a maximum sulfur standard of 15 ppmw for all diesel-fueled on-road vehicles. The current U.S. EPA on-road diesel fuel standard is shown in Table III-6.

3. U.S. EPA Non-Road Diesel Fuel Specifications

Until recently, fuel supplied to outside of California was allowed a sulfur content of up to 5,000 ppmw (parts per million by weight). However, in 2004, the U.S. EPA published a strengthened rule for the control of emissions from non-road diesel engines and fuel. The U.S. EPA rulemaking requires that sulfur levels for non-road diesel fuel be reduced from current uncontrolled levels of 5,000 ppmw ultimately to 15 ppmw, though an interim cap of 500 ppmw is contained in the rule. Beginning June 1, 2007, refiners were required to produce non-road, locomotive and marine diesel fuel that meets a maximum sulfur level of 500 ppmw. This does not include diesel fuel for stationary sources. In 2010, non-road diesel fuel will be required to meet the 15 ppmw standard except for locomotives and marine vessels. In 2012, non-road diesel fuel used in locomotives and marine applications must meet the 15 ppmw standard. The non-road diesel fuel standards are shown in Table III-6.

Table III-6: U.S. EPA Diesel Fuel Standards

Applicability	Implementation Date	Maximum Sulfur Level (ppmw)	Aromatics Maximum (% by volume)	Cetane Index (Minimum)
On-Road	2006	15	35	40
Non-road *	1993	5,000	35	40
Non-road *	2007	500	35	40
Non-road, *excluding loco/marine* *	2010	15	35	40
Non-road, *loco/marine* *	2012	15	35	40

* Non-road diesel fuels must comply with ASTM No. 2 diesel fuel specifications for aromatics and cetane.

4. What are the Current Properties of In-Use Diesel Fuel?

Table III-7 shows average values for in-use sulfur levels and four other properties for motor vehicle diesel fuel sold in California after the California and Federal diesel fuel regulations became effective in 1993. The corresponding national averages are shown for the same properties for on-road diesel fuel only since the U.S. EPA sulfur standard does not apply to off-road or non-vehicular diesel fuel. Non-road diesel fuel sulfur levels have been recorded as about 3,000 ppmw in-use and aromatics level of about 35 percent by volume in-use.

Table III-7: Average 1999 Properties of Reformulated Diesel Fuel

Property	California	U.S.[1]
Sulfur, ppmw	10[2]	10 [2]
Aromatics, vol.%	19	35
Cetane No.	50	45
PNA[3], wt.%	3	NA
Nitrogen, ppmw	150	110

1 U.S. EPA, December 2000
2 Based on margin to comply with 15 ppmw sulfur standards in June 2006
3 Poly-nuclear aromatic

5. Diesel Fuels Used by California-Based Locomotives

The ARB Board approved a regulation in November 2004 which extended the CARB diesel fuel requirements to intrastate locomotives (those operating 90 percent or more of the time in California) effective on January 1, 2007. UP and BNSF agreed in the 2005 railroad Agreement to dispense only CARB diesel or U.S. EPA on-road diesel fuels to interstate locomotives that fuel in California beginning on January 1, 2007.

Line haul locomotives have a range of about 800 to 1,200 miles between fueling. UP locomotives typically refuel at Rawlins, Wyoming or Salt Lake City, Utah before traveling to Roseville in northern California or UP Colton in southern California. These major out-of-state railroad facilities have the option to use Federal non-road diesel fuels for the refueling of line haul locomotives. When these out-of-state line-haul locomotives arrive

in California they typically have about 10 percent remaining volume of diesel fuel relative to their tank capacity.

UP surveyed each of the California fueling centers, and major interstate fueling centers to California, to estimate the average diesel fuel properties for locomotives for the railyard health risk assessments. In 2005, Chevron was UP's Railroad's principal supplier of diesel fuel. Chevron's California refineries produced only one grade ("low sulfur diesel" or LSD) in 2005. Quarterly average sulfur content for these refineries ranged from 59 ppmw to 400 ppmw, with an average of 221 ppmw. This value is assumed to be representative of California fuel used by UPRR. Non-California diesel fuel for 2005 is estimated to have a sulfur content of 2,639 ppmw, based on the estimated 49-state average fuel sulfur content used by the U.S. Environmental Protection Agency in its 2004 regulatory impact analysis.

The U.S. EPA on-road and CARB on and off-road diesel ultra low sulfur specifications (15 ppmw) went into effect on June 1, 2006. The CARB diesel fuel requirements for intrastate locomotives went into effect on January 1, 2007. The U.S. EPA non-road diesel fuel sulfur limit dropped from 5,000 ppmw to 500 ppmw on June 1, 2007. In 2012, the non-road diesel fuel limits for used in locomotives and marines will drop from 500 ppmw to 15 ppmw.

The NOx emission benefits associated with the use of CARB diesel compared to U.S. EPA on-road and non-road diesel fuels are due to the CARB aromatic hydrocarbon limit of 10 percent by volume or an emission equivalent alternative formulation limit. ARB staff estimates that use of CARB diesel provides a 6 percent reduction in NOx and a 14 percent reduction in particulate emissions compared with the use of U.S. EPA on-road and non-road diesel fuels. In addition, CARB diesel fuel will provide over a 95 percent reduction in fuel sulfur levels in 2007 compared to U.S. EPA non-road diesel fuel. This reduction in diesel fuel sulfur levels will provide SOx emission reductions, and additional PM emission reductions by reducing indirect (secondary formation) PM emissions formed from SOx.

In addition, the ARB, UP and BNSF entered into an agreement in 2005 which requires that at least 80 percent of the interstate locomotives must be fueled with either CARB diesel or U.S. EPA on-road ultra low sulfur diesel fuel by January 1, 2007. Both the CARB diesel fuel regulation for intrastate locomotives and the 2005 Railroad Agreement for interstate locomotives require the use of ultra low sulfur diesel fuel in 2007, five years earlier than the U.S. EPA non-road diesel fuel regulations for locomotives in 2012.

6. What are the Potential Overall Benefits from the Use of Lower Sulfur Diesel Fuels?

Both the U.S. EPA and CARB diesel fuels had sulfur levels lowered from 500 ppmw to 15 ppmw on June 1, 2006. Under the prior sulfur specification of 500 ppmw, CARB diesel fuel in-use sulfur levels averaged around 140 ppmw versus U.S. EPA on-road sulfur levels of about 350 ppmw. With the 2006 implementation of the 15 ppmw sulfur levels, in-use levels for both CARB diesel and U.S. EPA on-road now average about 10 ppmw.

Sulfur oxides and particulate sulfate are emitted in direct proportion to the sulfur content of diesel fuel. Reducing the sulfur content of diesel fuel from the California's statewide average of 140 ppmw to less than 10 ppmw would reduce sulfur oxide emissions by about 90 percent or by about 6.4 tons per day from 2000 levels. Direct diesel particulate matter emissions would be reduced by about 4 percent, or about 0.6 tons per year in 2010 for engines not equipped with advanced particulate emissions control technologies. U.S. EPA on-road lower sulfur diesel fuel would provide similar levels of sulfur oxide and direct diesel particulate matter emission reductions.

The emissions reductions would be obtained with low sulfur diesel used in mobile on-road and off-road engines, portable engines, and those stationary engines required by district regulations to use CARB diesel. In addition, NOx emissions would be reduced by 7 percent or about 80 tons per year for those engines not currently using CARB diesel, assumed to be about 10 percent of the stationary engine inventory and including off-road mobile sources such as interstate locomotives.

The lower sulfur diesel makes much more significant emissions reductions possible by enabling the effective use of advanced emission control technologies on new and retrofitted diesel engines. With these new technologies, emissions of diesel particulate matter and NOx can be reduced by up to 90 percent. Significant reductions of non-methane hydrocarbons and carbon monoxide can also be achieved with these control devices.

C. Off-Site Diesel PM Emissions Summary

ARB staff analyzed the significant off-site emission sources based on two categories: mobile and stationary. The off-site emissions were estimated for the sources within a one-mile distance from the boundary of the UP Colton railyard.

1. Mobile Sources

For the off-site mobile sources, the analysis focused on on-road heavy duty diesel trucks, as they are the primary source of diesel PM from the on-road vehicle fleet. ARB staff estimated mobile emissions based on roadway specific vehicle activity data and allocated them to individual roadway links. All roadway links within a one-mile distance from the boundary of the UP Colton railyard are included in the analysis. The estimates do not include the diesel PM emissions generated from other modes such as extended idling, starts, and off-road equipment outside the rail yards. Individual sources such as local truck distribution centers and warehouses were not evaluated due to insufficient activity data, but their truck traffic related to these facilities is reflected in the roadway link traffic activities. Because the off-site mobile sources have only focused on the on-road diesel emissions, the exclusion of extended idling and off-road equipment may result in an underestimation of off-site mobile sources emissions.

Roadway link: is defined as a discrete section of roadway with unique estimates for the fleet specific population and average speed and is classified as a freeway, ramp, and major arterial, minor arterial, collector, or centroid connector.

Within a one-mile distance from the boundary of the UP Colton railyard, off-site diesel PM emissions are predominantly generated by mobile sources which emit around 42 tons per year. The majority of the off-site diesel PM emissions are from diesel-fueled heavy duty trucks traveling on freeway I-10 and major local streets.

Table III-8: Off-site Mobile Source Diesel PM Emissions by Freeways

Sources	Diesel PM Emissions	
	Tons per year	Percent of Total Off-site Mobile Sources
I-10 Freeway	32.7	78%
Local Streets	9.3	22%
TOTAL	42.0	100%

As shown in Table III-8, the freeways I-10 contribute approximately 32.7 tons per year of diesel PM emissions, which account for over 78% of total mobile sources diesel PM emissions. The remaining 9.3 tons of off-site diesel PM emissions, or 22%, of the total diesel PM emissions are from diesel-fueled trucks traveling on local streets. The methodology for mobile diesel PM emission estimation is presented in Appendix A.

The diesel PM off-site mobile source emissions were estimated based on the local traffic flow, and calculated by different classifications of truck gross vehicle weights, as shown in Table III-9. For the year 2005, the total diesel PM emissions from mobile sources are estimated at about 42 tons per year with 30.3 tons per year or 72% from heavy-heavy duty trucks. Medium – heavy duty trucks account for about 6.1 tons per year or 15% and light-heavy duty trucks 5.5 tons per year or 13% respectively. Off-site mobile source diesel PM emissions by vehicle type are shown in Table III-9.

Table III-9: Off-site Mobile Source Diesel PM Emissions by Vehicle Type

Vehicle Types of Off-Site Mobile Diesel PM Sources	Gross Vehicle Weight (pounds)	Diesel PM Emissions	
		Tons per year	Percent of Total
Light-Heavy Duty Diesel Trucks	8,501-14,000	**5.5**	**13%**
Medium-Heavy Duty Diesel Trucks	14,001-33,000	**6.1**	**15%**
Heavy-Heavy Duty Diesel Trucks	> 33,000	**30.3**	**72%**
Total	**-**	**42.0***	**100%**

*Numbers may not add up due to rounding

2. Stationary Sources

Emissions from off-site stationary source facilities are identified using the California Emission Inventory Development and Reporting System (CEIDARS) database, which contains information reported by the local air districts for stationary sources within their jurisdiction. The CEIDARS facilities whose locations fell within the one-mile distance from the boundary of the UP Colton railyard are selected. Diesel PM emissions are estimated from stationary internal combustion (IC) engines burning diesel fuel, operating at stationary sources reported in CEIDARS.

Within a one-mile distance from the boundary of the UP Colton railyard, the diesel PM emissions from stationary sources are estimated at about 1.5 tons per year, or about 3% of the total off-site diesel PM emissions. Three major stationary sources, California Portland Cement Company, Arrowhead Regional Medical Center, and General American Transportation Corporation (GATX) contribute about 1.5 tons per year of the off-site diesel PM emissions. There is a large number bulk fuel storage facilities operated by Kinder Morgan, Shell, BP and others within one-mile of the railyard boundary. However, these facilities only emit TACs. These TACs were accounted for in the potency weighted emission tables.

ARB staff also evaluated other toxic air contaminant (TACs) emissions around the UP Colton Railyard. The total emissions of toxic air contaminants, other than diesel PM emitted from the stationary sources, were estimated at about 25 tons per year. Over 70 toxic air contaminant species are identified among these emissions, in which ammonia, toluene and Xylene are the three major contributors with emissions estimated at 5, 2, and 3 tons per year, respectively. Not all of these toxic air contaminants are identified as carcinogens.

According to ARB's *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (ARB, 2000), diesel PM, 1,3-butadiene, benzene, carbon tetrachloride, and formaldehyde are defined as the top 5 potential cancer risk contributors, based on ambient concentrations. These TACs account for 95% of the State's estimated potential cancer risk levels. This study also concluded that diesel PM contributes over 70% of the state's estimated potential cancer risk levels, which are significantly higher than other TACs (ARB, 2000). Among the off-site TACs emissions, the top 5 cancer risk contributors (without diesel PM) are estimated at about 9.0 tons per year.

The Office of Environmental Health Hazard Assessment (OEHHA) has estimated an inhalation cancer potency factor (CPF) for individual chemicals and some chemical mixtures such as whole diesel exhaust. Diesel PM contains many individual cancer causing chemicals. The individual cancer causing chemicals from diesel exhaust are not separately evaluated so as to avoid double counting. The four compounds listed here are given a weighting factor by comparing each compound's CPF to the diesel PM CPF. This factor is multiplied by the estimated emissions for that compound, which gives the cancer potency weighted toxic emission as shown in Table III-10. As can be seen in Table III-10, the potency weighted toxic emissions for these TACs are about 0.247 tons per year, which is substantially less than off-site diesel PM emissions. Hence, they are not included in the analysis.

Cancer potency factors (CPF) are expressed as the 95% upper confidence limit of excess cancer cases occurring in an exposed population assuming continuous lifetime exposure to a substance at a dose of one milligram per kilogram of body weight, and are expressed in units of $(mg/kg\text{-}day)^{-1}$.

The detailed methodology of off-site stationary source emissions is presented in Appendix B.

Table III-10: Cancer Potency Weighted Toxic AIR Contaminant Emissions from Significant Off-Site Stationary Sources Surrounding UP Colton Railyard

Compound	Cancer Potency Factor	Weighting Factor	Estimated Emission (tons/year)	Potency Weighted Toxic Emission (tons/year)
Diesel PM	1.1	1	43.5	**43.5**
1,3-Butadiene	0.6	0.55	0.021	**0.012**
Benzene	0.1	0.09	0.736	**0.066**
Carbon Tetrachloride[§]	0.15	0.14	0.000056	**0.000**
Formaldehyde	0.021	0.02	8.48	**0. 169**
Total (non-diesel PM)	**-**	**-**	**9.24***	**0.247**

*: Numbers may not add precisely due to rounding.

[§] Very very small amount of carbon tetrachloride are emitted today. Ambient concentrations are highly influenced by past emissions due to the long atmospheric life time of this compound.

Table III-11: Emissions of Major Toxic Air Contaminants from Gasoline Sources in South Coast Air Basin

Compound	TACs Emissions (tons/year)			
	From All Sources	Potency Weighted**	From Gasoline Vehicles	Potency Weighted**
Diesel PM	7,746	**7,746**	-	-
1,3-Butadiene	695	**382**	420	**231**
Benzene	3,606	**325**	2,026	**182**
Formaldehyde	4,623	**92**	1,069	**21**
Acetaldehyde	1,743	**16**	314	**3**
Total (non-diesel PM)	10,668	**816**	3,829	**438**

**: Based on cancer potency weighting factors.

In addition, ARB staff evaluated the potential cancer risk levels caused by the use of gasoline in the South Coast Air Basin. Table III-11 shows the emissions of four major carcinogenic toxic air contaminants South Coast Air Basin gasoline sources in 2005 (ARB, 2006a). As indicated in Table III-11, the potency weighted emissions of these four toxic air contaminants from all types of gasoline sources are estimated at about 816 tons per year, or about 11% of diesel PM emissions in South Coast Air Basin. If only gasoline-powered vehicles are considered, the potency weighted emissions of these four TACs are estimated at about 438 tons per year, or about 6% of diesel PM emissions in the Basin. Hence, gasoline-powered vehicular sources are not included in the analysis.

IV. AIR DISPERSION MODELING FOR THE UP COLTON RAILYARD

In this chapter, ARB staff presents the air dispersion modeling performed to estimate the transport and dispersion of diesel PM emissions resulting from the sources in and around the UP Colton Railyard. A description of the air quality modeling parameters is listed, including air dispersion model selection, emission source characterizations, meteorological data, model receptor network, and building wake effects. ARB staff also describes model input preparation and output presentation.

A. Air Dispersion Model Selection

Air dispersion models are often used to simulate atmospheric processes for applications where the spatial scale is in the tens of meters to tens of kilometers. Selection of air dispersion models depends on many factors, such as characteristics of emission sources (point, area, volume, or line), the type of terrain (flat or complex) at the emission source locations, and source-receptor relationships. For the UP Colton Railyard, ARB staff selected the U.S. EPA's newly approved air dispersion model AERMOD to estimate the impacts associated with diesel PM emissions in and around the railyard. AERMOD stands for American Meteorological Society / Environmental Protection Agency Regulatory Model Improvement Committee (**AER**MIC) **MOD**EL. It is a state-of-science air dispersion model and is a replacement for its predecessor, the U.S. EPA Industrial Sources Complex (ISC) air dispersion model.

AERMOD has become a U.S. EPA regulatory dispersion model specified by the *U.S. EPA Guideline for Air Quality Methods (*40 CFR Part 51, Appendix W*)* (U.S. EPA, 2005). AERMOD is also the recommended model in the *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (ARB, 2006d).

AERMOD is a steady-state plume model that incorporates current concepts about air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. These approaches have been designed to be physically realistic and relatively simple to implement.

B. Source Characterization and Parameters

The emission sources from the locomotives and other mobile sources at the UP Colton Railyard are characterized as required by the ARB Guidelines (ARB, 2006c). Emission sources were treated as either point or volume sources in the dispersion modeling. Point source treatment includes calculated plume rise based on source stack dimensions and exhaust parameters, and hour-by-hour meteorological conditions; volume source treatment includes user-specified release height and initial horizontal and vertical dispersion. Larger stationary emission sources (e.g., idling locomotives and cranes where present) were treated as a series of point sources within their areas of operation. Spacing between sources was selected based on the magnitude of

emissions and the proximity to off-site receptors. Smaller and moving sources (e.g., idling and moving trucks, and moving locomotives) were treated as a series of volume sources. Source spacing and initial dispersion coefficients for volume sources were also selected based on the magnitude of the emissions and the proximity to off-site receptors.

The emission rates for individual locomotives are a function of locomotive makes, notch setting, activity time, duration, and operating location. Emission source parameters for locomotive model classifications at the yard, including emission source height, diameter, exhaust temperature, and exhaust velocity. While the BNSF assumed more specific temperatures and stack heights from their switchers and line haul locomotives fleets, the UP used data from the *Roseville Railyard Study* (ARB, 2004) based on the most prevalent locomotive model of switchers and line hauls to parameterize locomotive emission settings. In total, the assumptions on the locomotive emission parameters are slightly different between UP and BNSF; however, both are within reasonable ranges according to their activities, and the slight differences in stack height have an insignificant impact on predicted air concentrations, within 2 percent, based on a sensitivity analysis conducted by ARB staff.

For the stationary locomotives, the locations of individual locomotive emission sources used for the model inputs were determined based on the detailed locomotive distribution and activity information provided by UP. The emissions from all other stationary sources (storage tanks, sand tower, waste water treatment plant, etc.) and portable sources (welders, steam cleaners, air compressors, etc.) are simulated as a series of point sources.

C. Meteorological Data

In order to run AERMOD, the following hourly surface meteorological data are required: wind speed, wind direction, ambient temperature, and opaque cloud cover. In addition, the daily upper air sounding data need to be provided (U.S. EPA, 2004b).

These meteorological variables are important to describe the air dispersion in the atmosphere. The wind speed determines how rapidly the pollutant emissions are diluted and influences the rise of emission plume in the air, thus affecting downwind concentrations of pollutants. Wind direction determines where pollutants will be transported. The difference of ambient temperature and the emission releasing temperature from sources determines the initial buoyancy of emissions. In general, the greater the temperature difference, the higher the plume rise. The opaque cloud cover and upper air sounding data are used in calculations to determine other important dispersion parameters. These include atmospheric stability (a measure of turbulence and the rate at which pollutants disperse laterally and vertically) and mixing height (the vertical depth of the atmosphere within which dispersion occurs). The greater the mixing height is, the larger the volume of atmosphere is available to dilute the pollutant concentration.

The meteorological data used in the model are selected on the basis of representativeness. Representativeness is determined primarily on whether the wind speed/direction distributions and atmospheric stability estimates generated through the use of a particular meteorological station (or set of stations) are expected to mimic those actually occurring at a location where such data are not available. Typically, the key factors for determining representativeness are proximity of the meteorological station and the presence or absence of nearby terrain features that might alter airflow patterns.

The UP Colton railyard does not monitor meteorological variables on site. Wind speed, wind direction, temperature, and cloud cover data from the Ontario International Airport were used for this project. To the extent that airflow patterns are spatially variable due to elevated terrain and land sea effects near the coast, judgment was exercised to select the monitoring stations that are most representative of conditions at the UP Colton Railyard and Ontario winds would be the most representative of conditions at the yard.

The selection of Ontario International Airport for surface winds data was largely dependent on the limited availability of data from other stations for the same years for which upper air data were available. There are several SCAQMD surface stations in the general vicinity of the railyard for which historical (1981) data are available, but only in a form usable in AERMOD's predecessor, ISCST3. AERMET, the meteorological preprocessor for AERMOD, required (at a minimum) data from one surface National Weather Service (NWS) station and one upper air NWS station. Ontario International Airport was used for surface data, and the Miramar Marine Corps NWS Air Station in San Diego was used for upper air data. Missing hourly surface data from Ontario International Airport were replaced by the last previous values available in the same dataset.

According to ARB railyard health risk assessment guidelines (ARB, 2006d), five years of meteorological data are recommended to be used in the air toxic health risk assessment. Surface parameters supplied to the model were specified for the area surrounding the surface meteorological monitoring site as recommended by AERMOD and the ARB *Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (ARB, 2006d). Eleven years worth of meteorological data from Ontario International Airport, for years 1990 through 2000, were processed with AERMET to assure that an adequate number of years of acceptable data completeness and quality would be available for AERMOD modeling. The meteorological data from 1999 were selected for the railyard dispersion modeling because it was one of the two years recorded after the anemometer height was adjusted, and it was the year with the most conservative (i.e., largest) distances of impact from a specified source (Sierra Research Report).

It is expected that year-to-year variability would not cause significant differences in the modeled health impacts, and hence would justify needing to subject the full set of receptors to only one year of meteorological data. This conclusion is based on modeling sensitivity analyses that were carried out by ARB staff using five years of meteorological data for the Stockton area (See Appendix G). The five annual average concentration patterns were compared with one another and with the average

predictions for the full five-year period. Differences between these were found to be negligible in terms of spatial concentration patterns, locations of highest concentrations, and absolute concentrations. Therefore, whether five-year or one-year meteorological data are used, the modeling results show similar estimated exposures and potential cancer risks surrounding the railyard facility.

Figure IV-1 presents the wind rose and Figure IV-2 provides the wind class frequency distributions for the meteorological data used in UP Colton Railyard air dispersion modeling. The yearly average wind speed is 2.8 meters per second. The prevailing wind over the modeling domain blows from southwest to northeast.

Wind rose: a rose-like shape plot that depicts wind speed and direction patterns to illustrate prevailing wind

Figure IV-1: Wind Rose Plot for Ontario International Airport Station in 2005

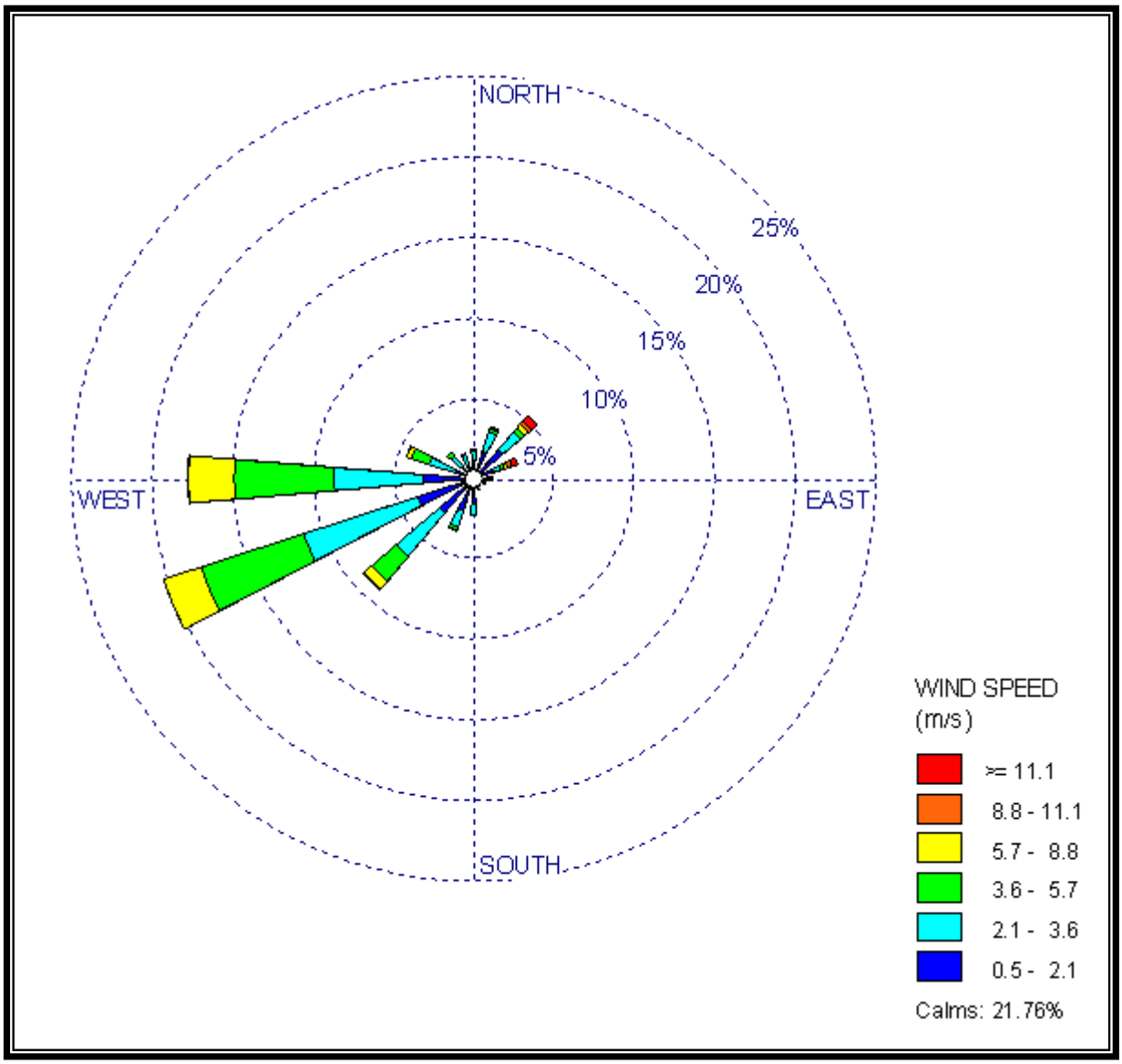
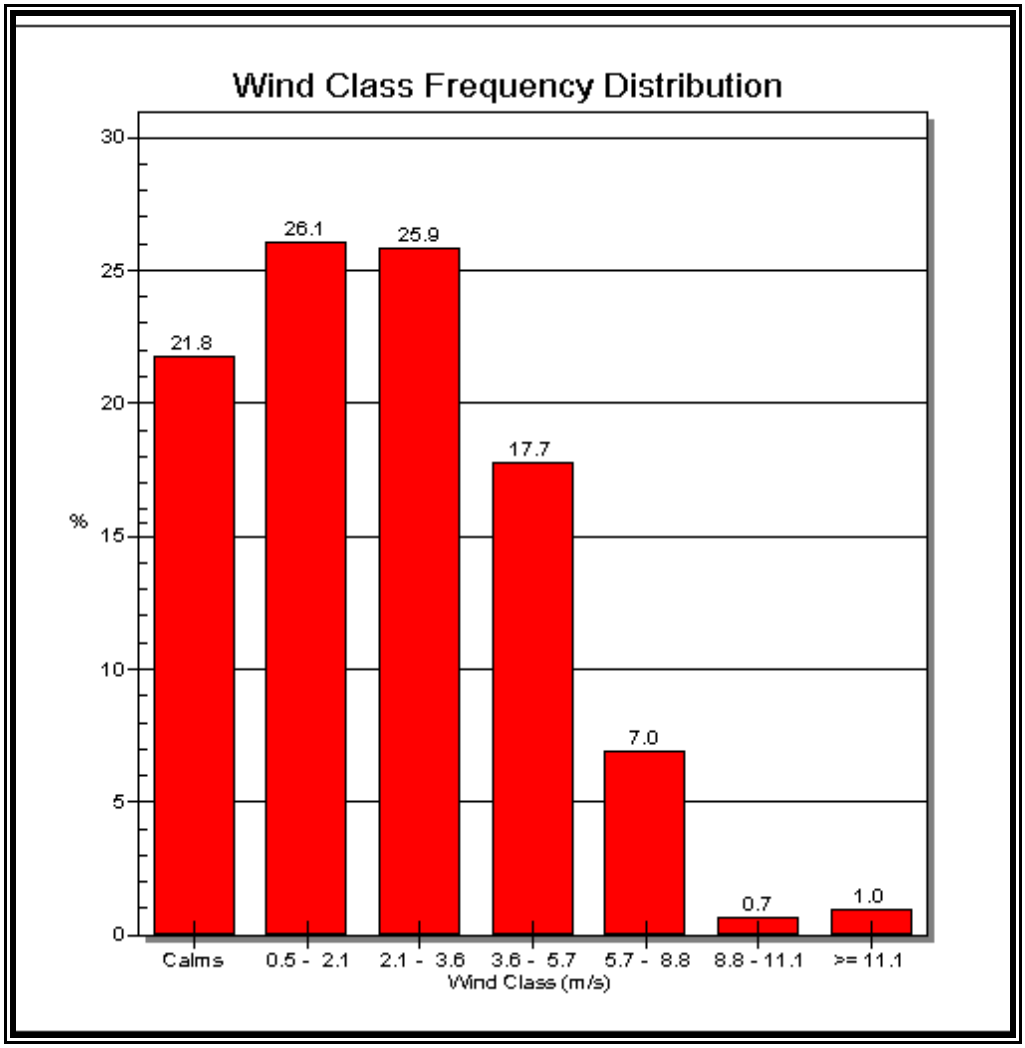


Figure IV-2: Wind Class Frequency Distribution Plot for Ontario International Airport Station Data in 2005



The detailed procedures of meteorological data preparation and quality control are described in Sierra Research Report.

D. Model Receptors

Model receptors are the locations where the model provides concentrations. A Cartesian grid receptor network is used in this study where an array of points are identified by their x (east-west) and y (north-south) coordinates. This receptor network is capable of identifying the emission sources within the railyard with respect to the receptors in the nearby residential areas.

According to the *ARB Railyard Health Risk Assessment Guidance* (ARB, 2006), the modeling domain is defined as a 20x20 km (km: kilometers) region, which covers the railyard in the center of the domain and extends to the surrounding areas. To better

capture the different concentration gradients surrounding the railyard area different receptor grid networks were used for the UP Colton Railyard air dispersion modeling assessment. The ARB's Guidance requires coarse and fine modeling receptor grids, in which the Cartesian receptor networks used in model simulations include a coarse receptor grid of 500 m x 500 m for the modeling analysis. A fine grid of 50 m x 50 m surrounding the railyard was used for modeling within 300 m of the fence line. A medium-fine grid of 100 m x 100 m was used for receptors between 300 and 600 m of the fence line around the fine grid network, and a medium grid of 200 m x 200 m was used for receptor distances between 600 and 1000 m.

Figure IV-3 shows the fine, medium fine, and medium grid receptor networks and Figure IV-4 illustrates the coarse grid receptor networks used in air dispersion modeling for the UP Colton Railyard.

Figure IV-3: Fine and Medium Grid Receptor Networks Used in Air Dispersion Modeling for UP Colton Railyard

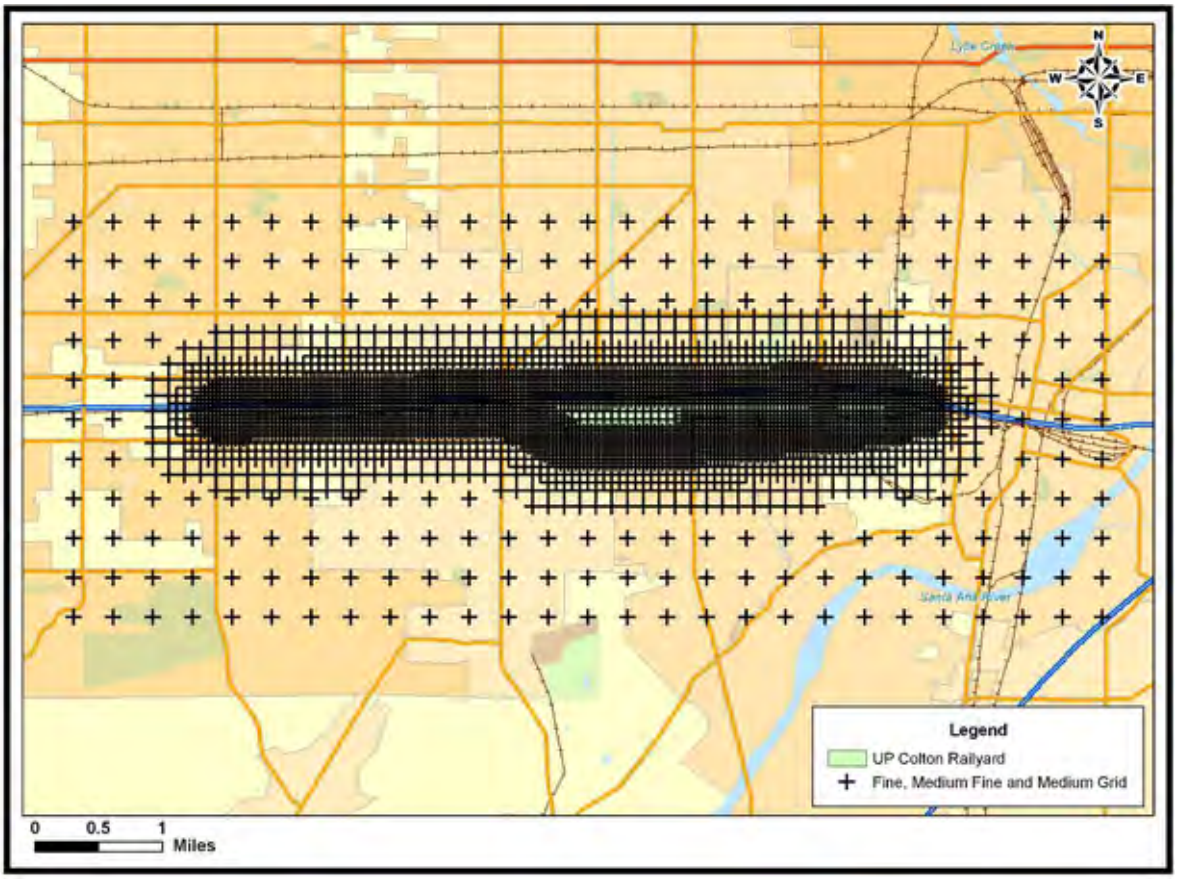
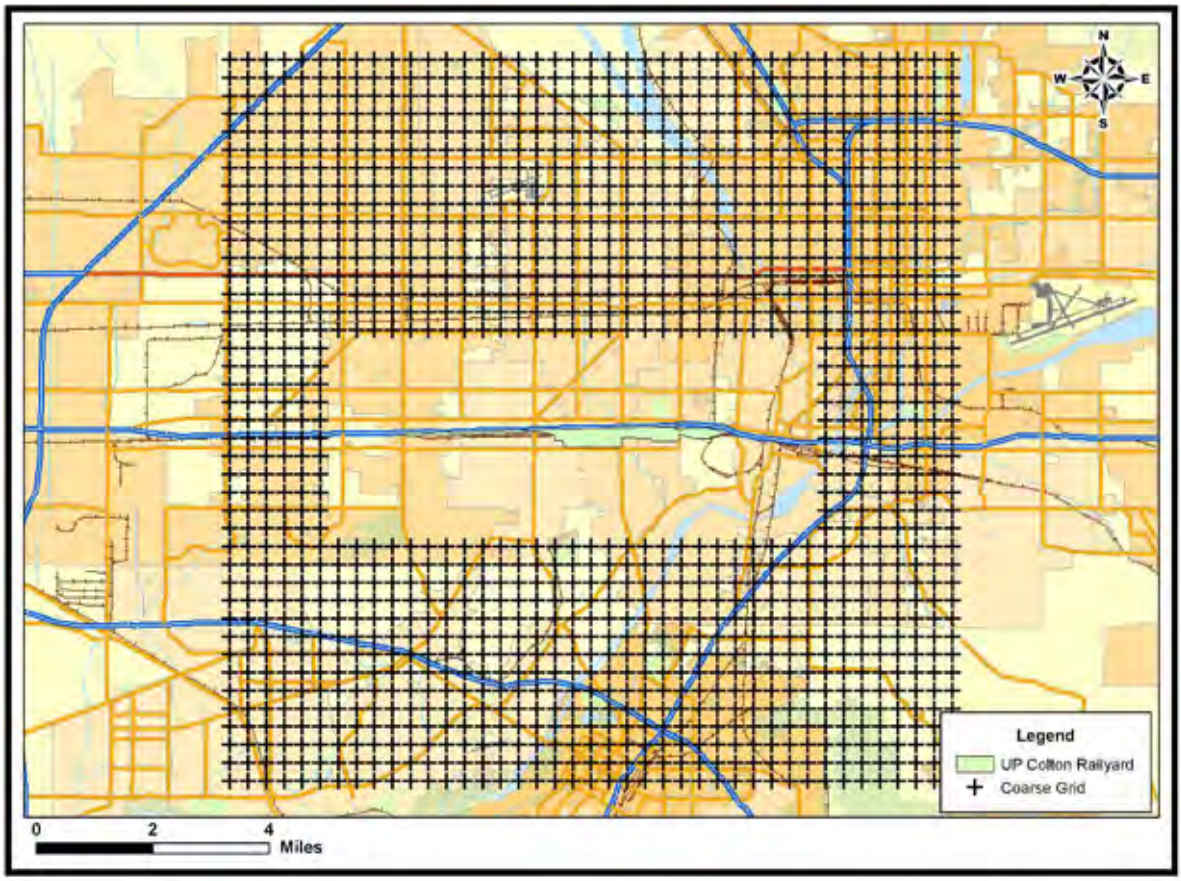


Figure IV-4: Coarse Grid Receptor Networks Used in Air Dispersion Modeling for UP Colton Railyard



E. Building Wake Effects

If pollutant emissions are released at or below the "Good Engineering Practice" height as defined by U.S. EPA Guidance (U.S. EPA, 2004a), the plume dispersion may be affected by surrounding facility buildings and structures. The aerodynamic wakes and eddies produced by the buildings or structures may cause pollutant emissions to be mixed more rapidly to the ground, causing elevated ground level concentrations. The AERMOD model has the option--Plume Rise Model Enhancements-- to account for potential building-induced aerodynamic downwash effects. Although UP included building wake effects in their modeling analyses, BNSF conducted a sensitivity analysis and found that the building wake effect has an insignificant impact on the diesel PM air concentrations of the railyard (ENVIRON, 2006b). Detailed treatment of building wake effects is documented in the air dispersion modeling report by the Sierra Research, Inc.

F. Model Implementation Inputs

AERMOD requires four types of basic implementation inputs: control, source, meteorological, and receptor. Control inputs are required to specify the overall job control options for the model run, such as dispersion option, pollutant species, averaging time, etc. Source inputs require source identification and source type (point or volume). Each source type requires specific parameters to define the source. The required inputs for a point source are emission rate, release height, emission source diameter, exhaust exit temperature, and exhaust exit velocity.

Meteorological and receptor inputs have been discussed in Sections C and D. The requirements and the format of input files to the AERMOD are documented in the user's guide of AERMOD (U.S. EPA, 2004b). The model input files for this study are provided in Sierra Research Report.

V. HEALTH RISK ASSESSMENT OF THE UP COLTON RAILYARD

This chapter discusses how to characterize potential cancer and non-cancer risks associated with exposure to toxic air contaminants (TACs), especially diesel PM, emitted in and around the UP Colton Railyard. In addition, the detailed health risk assessment (HRA) results are presented and the associated uncertainties are discussed qualitatively.

A. Health Risk Assessment Guidelines

The railyard HRA follows *The Air Toxics Hot Spots Program Risk Assessment Guidelines* published by OEHHA, and is consistent with the methodologies used for the UP Roseville Railyard Study (ARB, 2004a). The OEHHA Guidelines outline a tiered approach to risk assessment, providing risk assessors with flexibility and allowing for consideration of site-specific differences:

- Tier 1: a standard point-estimate approach that uses a combination of the average and high-end point-estimates.
- Tier 2: utilizes site-specific information for a risk assessment when site-specific information is available and is more representative than the Tier 1 point-estimates.
- Tier 3: a stochastic approach for exposure assessment when the data distribution is available.
- Tier 4: also a stochastic approach, but allows for utilization of site-specific data distribution.

The Health Risk Assessment is based on the yard specific emission inventory and air dispersion modeling predictions. The OEHHA Guidelines recommend that all health hazard risk assessments adopt a Tier-1 evaluation for the Hot Spots Program, even if other approaches are also presented. Two point-estimates of breathing rates in Tier-1 methodology are used in this HRA, one representing an average and the other representing a high-end value based on the probability distribution of breathing rate. The average and high-end of point-estimates are defined as 65th percentile and 95th percentile from the distributions identified in the OEHHA Guidelines (OEHHA, 2000). In 2004, ARB recommended the interim use of the 80th percentile value (the midpoint value of the 65th and 95th percentile breathing rates referred as an estimate of central tendency) as the minimum value for risk management decisions at residential receptors for the breathing intake (ARB, 2004b). The 80th percentile corresponds to a breathing rate of 302 Liters/Kilogram-day (302 L/Kg-day) from the probability distribution function. As indicated by the OEHHA Guidelines, the Tier-1 evaluation is useful in comparing risks among a number of facilities and similar sources.

> **Percentile:** Any one of the points dividing a distribution of values into parts each of which contain 1/100 of the values. For example, the 65th percentile breathing rate is a value such that the breathing rates from 65 percent of population are less or equal to it.

The ARB has also developed *Health Risk Assessment Guidance for Railyard and Intermodal Facilities* to help ensure that the air dispersion modeling and HRA performed for each railyard meet the OEHHA guidelines.

B. Exposure Assessment

Exposure assessment is a comprehensive process that integrates and evaluates many variables. Three process components have been identified to have significant impacts on the results of a health risk assessment – emissions, meteorological conditions, and exposure duration of nearby residents. The emissions have a linear effect on the risk levels, given meteorological conditions and defined exposure duration. Meteorological conditions can also have a critical impact on the resultant ambient concentration of a toxic pollutant, with higher concentrations found along the predominant wind direction and under calm wind conditions. An individual's proximity to the emission plume, how long he or she breathes the emissions (exposure duration), and the individual's breathing rate play key roles in determining potential risk. In general, the longer the exposure times for an individual, the greater the estimated potential risk for the individual. The risk assessment adopted in this study generally assumes that the receptors will be exposed to the same toxic levels for 24 hours per day for 70 years. If a receptor is exposed for a shorter period of time to a given pollutant concentration of diesel PM, the cancer risk will proportionately decrease. Children have a greater risk than adults because they have greater exposure on a per unit body weight basis and also because of other factors.

Diesel PM is not the only toxic air contaminant (TAC) emitted in the UP Colton Railyard. A relatively small amount of gasoline toxic air contaminants is generated from the gasoline storage tanks (including isopentane, toluene, benzene, etc.). Some other toxic air contaminants, such as xylene, toluene and ethyl benzene are emitted from the wastewater treatment plant. The detailed emission inventories for these TACs are presented in the *Toxic Air Contaminant Emissions Inventory and Air Dispersion Modeling Report for the UP Colton Rail Yard, Bloomington , California* (Sierra Research, 2007). The total amount of these toxic air contaminants emissions is about 0.21 tons or 420 pounds per year, compared to the 16.5 tons per year of the diesel PM emissions in the railyard. In addition, adjusting these emissions on a cancer potency weighted basis for their toxic potential (see a similar analysis for off-site air toxic contaminants in Table II-3), these non-diesel PM toxic air contaminants emissions are about a factor of 80 less than a potency weighted emissions as compared to diesel PM (0.21tons per year vs. 16.54 tons per year). Hence, only diesel PM emissions are presented in the on-site emission analysis.

ARB staff also evaluated other toxic air contaminant (TACs) emissions around the UP Colton Railyard. ARB staff also evaluated other toxic air contaminant (TACs) emissions around the UP Colton Railyard. The total emissions of toxic air contaminants, other than diesel PM emitted from the stationary sources, were estimated about 25 tons per year. Over 70 toxic air contaminant species are identified among these emissions, in which ammonia, toluene and xylene are the three major contributors

with emissions estimated at 5, 2, and 3 tons per year, respectively. Not all of these toxic air contaminants are identified as carcinogens.

According to ARB's *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (ARB, 2000), diesel PM, 1,3-butadiene, benzene, carbon tetrachloride, and formaldehyde are defined as the top 5 potential cancer risk contributors, based on ambient concentrations. These TACs account for 95% of the State's estimated potential cancer risk levels. This study also concluded that diesel PM contributes over 70% of the state's estimated potential cancer risk levels, which are significantly higher than other TACs (ARB, 2000). Among the off-site TACs emissions, the top 5 cancer risk contributors (without diesel PM) are estimated at about 9.0 tons per year.

The Office of Environmental Health Hazard Assessment (OEHHA) has estimated an inhalation cancer potency factor (CPF) for individual chemicals and some chemical mixtures such as whole diesel exhaust. Diesel PM contains many individual cancer causing chemicals. The individual cancer causing chemicals from diesel exhaust are not separately evaluated so as to avoid double counting. The four compounds listed here are given a weighting factor by comparing each compound's CPF to the diesel PM CPF. This factor is multiplied by the estimated emissions for that compound, which gives the cancer potency weighted toxic emission as shown in Table V-1. As can be seen in Table V-1, the potency weighted toxic emissions for these TACs are about 0.247 tons per year, which is substantially less than the diesel PM emissions.

In addition, ARB staff evaluated the potential cancer risk levels caused by the use of gasoline in the South Coast Air Basin. Table V-2 shows the emissions of four major carcinogen compounds of gasoline exhausts in South Coast Air Basin in the year of 2005 (ARB, 2006a). As indicated in Table V-2, the cancer potency weighted emissions of these four toxic air contaminants from all types of gasoline sources are estimated at about 816 tons per year, or about 11% of diesel PM emissions in South Coast Air Basin. If only gasoline-powered vehicles are considered, the potency weighted emissions of these four TACs are estimated at about 438 tons per year, or about 6% of diesel PM emissions in the Basin. Hence, gasoline-powered vehicular sources are not included in the analysis.

Table V-1: Cancer Potency Weighted Toxic Air Contaminant Emissions from Significant Off-Site Stationary Sources Surrounding UP Colton Railyard

Compound	Cancer Potency Factor	Weighting Factor	Estimated Emission (tons/year)	Potency Weighted Toxic Emission (tons/year)
Diesel PM	1.1	1	43.5	**43.5**
1,3-Butadiene	0.6	0.55	0.021	**0.012**
Benzene	0.1	0.09	0.736	**0.066**
Carbon Tetrachloride**	0.15	0.14	0.000056	**0.000**
Formaldehyde	0.021	0.02	8.48	**0. 169**
Total (non-diesel PM)	**-**	**-**	**9.23***	**0.247**

*: Numbers may not add precisely due to rounding.

Table V-2: Emissions of Major Toxic Air Contaminant Emissions from Gasoline Sources in South Coast Air Basin

Compound	TACs Emissions (tons/year)			
	From All Sources	Potency Weighted**	From Gasoline Vehicles	Potency Weighted**
Diesel PM	7,746	**7,746**	-	-
1,3-Butadiene	695	**382**	420	**231**
Benzene	3,606	**325**	2,026	**182**
Formaldehyde	4,623	**92**	1,069	**21**
Acetaldehyde	1,743	**16**	314	**3**
Total (non-diesel PM)	10,668	**816**	3,829	**438**

**: Based on cancer potency weighting factors.

** Very very small amount of carbon tetrachloride are emitted today. Ambient concentrations are highly influenced by past emissions due to the long atmospheric life time of this compound.

The relationship between a given level of exposure to diesel PM and the cancer risk is estimated by using the diesel PM cancer potency factor (CPF). A description of how the diesel cancer potency factor was derived can be found in the document entitled *Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant* (ARB, 1998); and a shorter description can be found in the *Air Toxics Hot Spot Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors* (OEHHA, 2002). The use of the diesel PM CPF for assessing cancer risk is described in the OEHHA Guidelines (OEHHA, 2003). The potential cancer risk is estimated by multiplying the inhalation dose by the CPF of diesel PM, i.e., $1.1(\text{mg/kg-day})^{-1}$.

C. Risk Characterization

Risk characterization is defined as the process of obtaining a quantitative estimate of risk. The risk characterization process integrates the results of air dispersion modeling and relevant toxicity data (e.g., diesel PM cancer potential factor) to estimate potential cancer or non-cancer health effects associated with air contaminant exposure.

Exposures to pollutants that were originally emitted into the air can also occur in different pathways as a result of breathing, dermal contact, ingestion of contaminated produce, and ingestion of fish that have taken up contaminants from water bodies. These exposures can all contribute to an individual's health risk. However, diesel PM risk is evaluated by the inhalation pathway only in this study because the risk contributions by other pathways of exposure are insignificant relative to the inhalation pathway. It should be noted that the background or ambient diesel PM concentrations are not incorporated into the risk quantification in this study. Therefore, the estimated potential health risk in the study should be viewed as risk level above those due to the background impacts.

Because the risk characterization is an integrated process from a series of procedures, the overall associated uncertainties are also linked to the uncertainty from each procedural component. Additional details and associated uncertainty on the risk characterization are provided in the Toxic Hot Spot Program Risk Assessment Guidelines (OEHHA, 2003), and discussed in Section D.

In the following sections, the predicted cancer and non-cancer risk levels resulting from on-site and off-site emissions are presented.

1. *Risk Characterization Associated with On-Site Emissions*

a) Cancer Risk

The potential cancer risks levels associated with the estimated diesel PM emissions at the UP Colton Railyard are displayed by using isopleths, based on the 80th percentile breathing rate and 70 year exposure duration for residents**.** In this study, ARB staff elected to present the cancer risk isopleths focusing on risk levels of 10, 25, 50, 100, 250, and 500 in a million. Figure V-1 and Figure V-2 present these isopleths. Figure V-1 focuses on the near source risk levels and Figure V-2 focuses the more

regional impacts. In each figure, the risk isopleths are overlaid onto a satellite image of the Bloomington area surrounding the UP Colton Railyard, to better illustrate the land use (residential, commercial, industrial, or mixed use) of these impacted areas.

The OEHHA Guidelines specify that, for health risk assessments, the cancer risk for the maximum exposure at the point of maximum impact be reported. The point of maximum impact (PMI), which is defined as a location or the receptor point with the highest cancer risk level outside of the facility boundary, with or without residential exposure, is predicted to be located at the northeast side of the railyard fence line (see Figure V-1). This is directly downwind of high emission density areas for the prevailing southwesterly wind, where locomotive activities (line haul, switchers, and locomotive service shop) generates about 50% of the facility-wide diesel PM emissions (see the emission allocation in Appendix E). The cancer risk at the PMI is estimated to be about 575 chances in a million. The land use in the vicinity of the PMI is primarily zoned as industrial use. However, there may be residents living in this zoned area. In the residential zoned area, the potential cancer risk of maximally exposed individual resident (MEIR) or maximum individual cancer risk (MICR) is estimated at about 150 chances in a million. As indicated by Roseville Railyard Study (ARB, 2004a), the location of the PMI may vary depending upon the settings of the model inputs and parameters, such as meteorological data set or emission allocations in the railyard. Therefore, given the estimated emissions, modeling settings, and the assumptions applied to the risk assessment, there are great uncertainties associated with the estimation of point of maximum impact (PMI) and maximum individual cancer risk (MICR). These indications should not be interpreted as a literal prediction disease incidence but more as a tool for comparison. In addition, the estimated point of maximum impact location and maximum individual cancer risk value may not be replicated by air monitoring.

ARB staff also conducted a comparison of cancer risks estimated at the PMI versus MICR, and the differences of facility-wide diesel PM emissions between the UP and BNSF railyards. The ratios of cancer risks at the PMI or MICR to the diesel PM emissions do not suggest that one railroad's facilities have statistically higher cancer risk than the other railroad's or vice versa. Rather, the differences are primarily due to emission spatial distributions from individual operations among railyards.

As indicated by Figure V-1, the UP Colton Railyard can be divided into three areas, eastern, central and western; the area with the greatest impact has an estimated potential cancer risk of over 250 chances in a million, occurring in a very small area next to the northeastern side of the railyard fence line, right next to freeway I-10. The estimated cancer risk is about 250 chances per million within approximately 200 yards from the northeastern side of railyard property boundary. At about 400 yards from the eastern side of the railyard boundary, the estimated cancer risks decrease to about 100 chances per million. As indicated by Figure V-2, the risks further decrease to 50 in a million within about half mile from the eastern side of the railyard, then to 25 in a million at approximately a 1 mile distance from the railyard boundaries. At about 2 miles from the eastern part of the railyard boundaries, the estimated cancer risks are at 10 in a million or lower. For the central part of the railyard the cancer risk is 100 in a million at about quarter a mile from the railyard boundary, and at about half a mile the cancer risk

is approximately 50 in a million. At about 1 mile the cancer risk is 25 in a million, and at about 1.5 miles the cancer risk is about 10 in a million or lower.

On the western side, the area with the greatest impact has an estimated potential cancer risk of over 100 chances in a million. This location is approximately 200 yards from the western part of the railyard boundary. At about quarter a mile the estimated cancer risk decreases to 50 in a million and then at half a mile, the estimated cancer risk is 25 in a million or lower. At about 1 mile the estimated the cancer risk decreases to about 10 in a million.

The OEHHA Guidelines recommend 70-year lifetime exposure duration to evaluate the potential cancer risks for residents. Shorter exposure durations of 30 years and 9 years may also be evaluated for residents and school-age children, respectively, as a supplement. These three exposure durations – 70 years, 30 years, and 9 years – all assume exposure for 24 hours a day, and 7 days a week. It is important to note that children, for physiological as well as behavioral reasons, have higher rates of exposure than adults on a per unit body weight basis (OEHHA, 2003).

To evaluate the potential cancer risks for off-site workers, the OEHHA Guidelines recommend that a 40-year exposure duration be used, assuming workers have a different breathing rate (149 Liters/Kilogram-day) and exposure for an 8-hour workday, five days a week, 245 days a year.

Table V-3 shows the equivalent risk levels of 70- and 30-year exposure durations for exposed residents; and 40- and 9-year exposure durations for workers and school-age children, respectively. As Table V-3 shows, the 10 in a million isopleth line in Figure V-2 would become 4 in a million for exposed population with a shorter residency of 30 years, 2.5 in a million for exposed school-age children, and 2 in a million for off-site workers.

To conservatively communicate the risks, ARB staff presents the estimated cancer risk isopleths all based on 70-year resident exposure duration, even for those impacted industrial areas where no resident lives.

Table V-3: Equivalent Potential Cancer Risk Levels for 70-, 40-, 30- and 9-Year Exposure Durations

Exposure Duration (Years)	Equivalent Risk Levels (Chances in a Million)				
70	10	25	50	100	250
30	4	11	21	43	107
9*	2.5	6.3	12.5	25	62.5
40‡	2	5	10	20	50

* Exposure duration for school-aged children.
‡ Exposure duration for off-site workers.

The more populated areas near the UP Colton Railyard are located to the west, north and southwest of the railyard. Based on the 2000 U.S. Census Bureau's data, the zone of impact of the estimated risks above 10 chances in a million levels encompasses approximately 17,000 acres where about 91,000 residents live. Table V-4 presents the exposed population and area coverage size for various impacted zones of cancer risks.

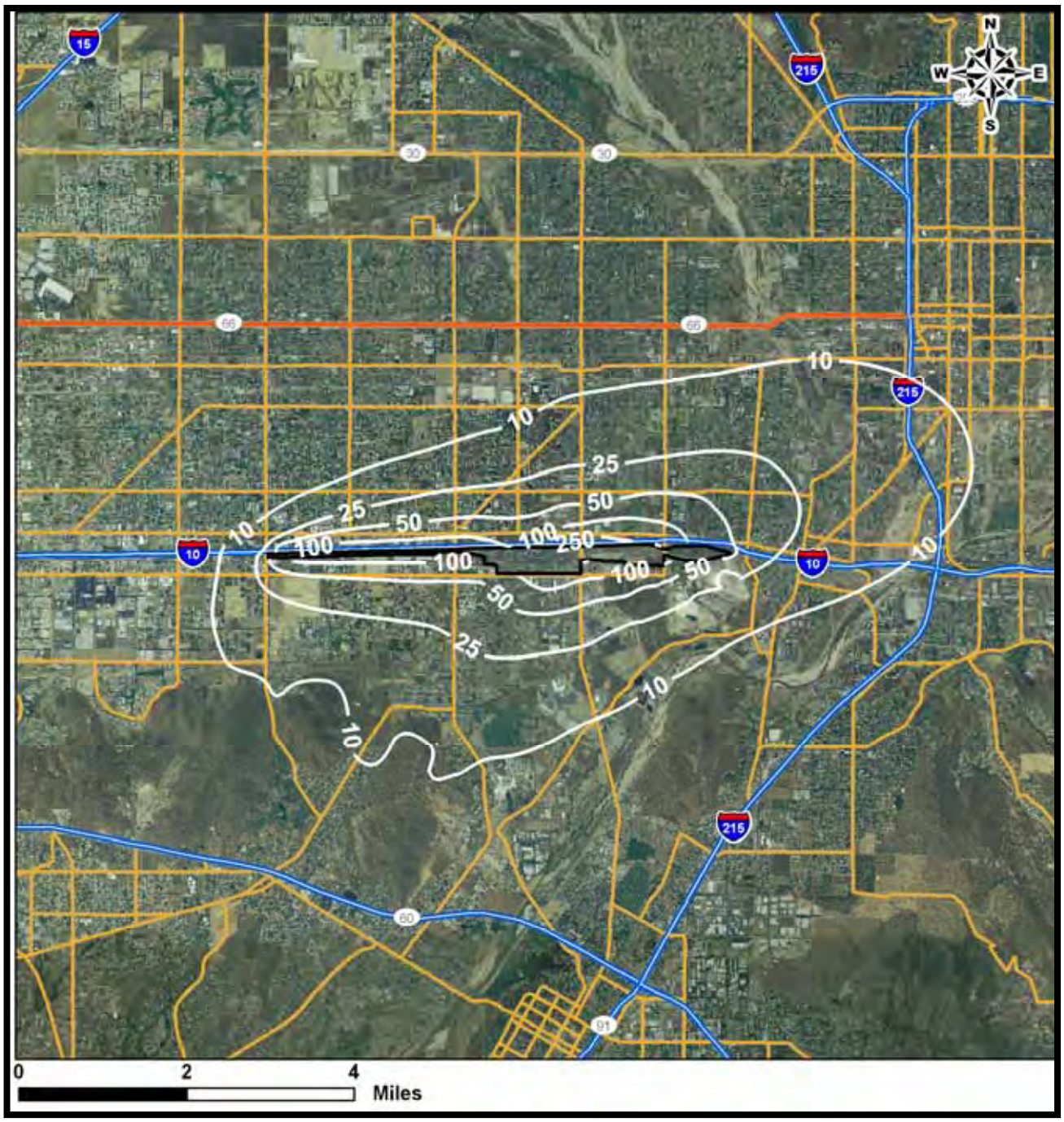
Table V-4: Estimated Impacted Areas and Exposed Population Associated with Different Cancer Risk Levels Estimated for UP Colton Railyard Diesel PM Emissions

Estimated Cancer Risk (chances per million)	Impacted Area (Acres)	Estimated Population Exposed
10 - 25	11,000	60,000
25-50	3,500	26,000
50-100	1,600	5,000
>100	635	320
>10	**17,000***	**91,000***

***** Numbers may not add up due to rounding

Figure V-1: Estimated Near-Source Cancer Risks (chances per million people) from the UP Colton Railyard

Figure V-2: Estimated Regional Cancer Risks (chances per million people) from the UP Colton Railyard



b) Non-Cancer Chronic Risk

The quantitative relationship between the amount of exposure to a substance and the incidence or occurrence of an adverse health impact is called the dose-response assessment. According to the OEHHA Guidelines (OEHHA, 2003), dose-response information for non-carcinogens is presented in the form of Reference Exposure Levels

(RELs). OEHHA has developed chronic RELs for assessing non-cancer health impacts from long-term exposure.

A chronic REL is a concentration level, expressed in units of micrograms per cubic meter ($\mu g/m^3$) for inhalation exposure, at or below which no adverse health effects are anticipated following long-term exposure. Long-term exposure for these purposes has been defined as 12% of a lifetime, or about eight years for humans (OEHHA, 2003).

The methodology for developing chronic RELs is fundamentally the same as that used by U.S. EPA in developing the inhalation Reference Concentrations (RfCs) and oral Reference Doses (RfDs). Chronic RELs are frequently calculated by dividing the no observed adverse effect level (NOAEL) or lowest observed adverse effect levels (LOAEL) in human or animal studies by uncertainty factors (OEHHA, 2003).

A substantial number of epidemiologic studies have found a strong association between exposure to ambient particulate matter and adverse health effects. For diesel PM, OEHHA has determined a chronic REL at $5\mu g/m^3$, with the respiratory system as the hazard index target (OEHHA, 2003).

It should be emphasized that exceeding the chronic REL does not necessarily indicate that an adverse health impact will occur. However, levels of exposure above the REL have an increasing but undefined probability of resulting in an adverse health impact, particularly in sensitive individuals (e.g., the very young, the elderly, pregnant women, and those with acute or chronic illnesses).

The significance of exceeding the REL is dependent on the seriousness of the health endpoint, the strength and interpretation of the health studies, the magnitude of combined safety factors, and other considerations (OEHHA, 2003).

It is important to note that Reference Exposure Level (REL) for diesel PM is essentially the U.S. EPA Reference Concentration first developed in the early 1990s based on histological changes in the lungs of rats. Since the identification of diesel PM as a Toxic Air Contaminant (TAC), California has evaluated the latest literature on particulate matter health effects to set the Ambient Air Quality Standard. Diesel PM is a component of particulate matter. Health effects from particulate matter in humans include illness and death from cardiovascular and respiratory disease, and exacerbation of asthma and other respiratory illnesses. Additionally, a body of literature has been published, largely after the identification of diesel PM as a TAC and adoption of the REL, which shows that diesel PM can enhance allergic responses in humans and animals. Thus, it should be noted that the REL does not reflect adverse impacts of particulate matter on cardiovascular and respiratory disease and deaths, exacerbation of asthma, and enhancement of allergic response.

The hazard index (HI) is then calculated by taking the annual average diesel PM concentration, and dividing by the chronic REL of $5\mu g/m^3$. An HI value of 1 or greater indicates an exceedance of the chronic REL, and some adverse health impact would be expected.

As part of this study, ARB staff conducted an analysis of the potential non-cancer chronic health impacts associated with exposures to the model-predicted levels of directly emitted diesel PM from on-site sources. The HI values were calculated, and then plotted as a series of isopleths in Figure V-3. As can be seen, the potential non-cancer chronic health hazard index from diesel PM emissions at the UP Colton Railyard are estimated to be less than 0.4. According to OEHHA Guidelines (OEHHA, 2003), these levels indicate that the potential non-cancer chronic public health risks are less likely to happen. The zone of impact where non-cancer chronic health hazard indexes are over 0.02 is an estimated area of 4500 acres.

Figure V-3 presents the spatial distribution of non-cancer chronic risks by health hazard index isopleths that range from 0.02 to 0.2 around the yard facility.

Figure V-3: Estimated Non-Cancer Chronic Risk Health Hazard Index from the UP Colton Railyard

c) Non-Cancer Acute Risk

According to the OEHHA guidelines, an acute reference exposure level (REL) is an exposure that is not likely to cause adverse health effects in a human population, including sensitive subgroups, exposed to that concentration for the specified exposure duration (generally one hour) on an intermittent basis. Non-cancer acute risk characterization involves calculating the maximum potential health impacts based on short-term acute exposure and reference exposure levels. Non-cancer acute impacts for a single pollutant are estimated by calculating a hazard index.

Due to the uncertainties in the toxicological and epidemiological studies, diesel PM as a whole was not assigned a short-term acute REL. It is only specific compounds of diesel exhaust (e.g., acrolein) that independently have potential acute effects (such as irritation of the eyes and respiratory tract), and an assigned acute REL. However, acrolein is primarily used as a chemical intermediate in the manufacture of adhesives and paper. It has also been found as a byproduct of any burning process, such as fire, and tobacco smoke. Acrolein is a chemically reactive and unstable compound, and easily reacts with a variety of chemical compounds in the atmosphere. Compared to the other compounds in the diesel exhaust, the concentration of acrolein has a much lower chance of reaching a distant off-site receptor. More importantly, given the multitude of activities ongoing at facilities as complex as railyards, there are much higher levels of uncertainties associated with hourly-specific emission data and estimated maximum concentrations, which are essential to assess acute risk. Therefore, non-cancer acute risk is not addressed quantitatively in this study. From a risk management perspective, ARB staff believes it is reasonable to focus on diesel PM cancer risk because it is the predominant risk driver and the most effective parameter to evaluate risk reduction actions. Further, actions to reduce diesel PM will also reduce non-cancer risks.

2. *Risk Characterization Associated with Off-Site Emissions*

ARB staff evaluated the impacts from off-site pollution sources near the UP Colton Railyard facility using the U.S. EPA-approved AERMOD dispersion model. Specifically, off-site mobile and stationary diesel PM emission sources located within a one-mile distance from the boundary\ of the UP Colton railyard was included. Diesel PM off-site emissions used in the off-site modeling runs consisted of about 42 tons per year from roadways and 1.5 tons per year from stationary facilities, representing emissions for 2005. The diesel PM emissions from UP Colton Railyard is not analyzed in the off-site air dispersion modeling. The same meteorological data and coarse receptor grid system used for on-site air dispersion modeling was used for the off-site modeling runs.

The estimated potential cancer risks and non-cancer chronic health hazard index associated with off-site diesel PM emissions are illustrated in Figure V-4 and Figure V-5. As indicated in Figure V-4, the zone of impacts of estimated cancer risks associated with off-site diesel PM emissions is significantly larger than that of the UP Colton Railyard. This result is expected because the diesel PM emissions from the significant off-site sources are equivalent to three times of the UP Colton Railyard diesel PM emissions. Figure V-5 illustrates that the non-caner chronic health risks associated with off-site diesel PM emissions are insignificant.

Based on the 2000 U.S. Census Bureau's data, the zone of impact of the estimated potential cancer risks above 25 chances in a million levels associated with off-site diesel PM emissions encompasses approximately 20,000 acres where about 100,000 residents live. For comparison with the UP Colton Railyard health risks, the same level of potential cancer risks (25 chances in a million) covers about 6,000 acres with a population of approximately 30,000. Table II-7 presents the exposed population and area coverage size for various impacted zones of cancer risks associated with off-site diesel PM emissions. Detailed calculations and methodologies used in off-site air dispersion modeling are presented in Appendix C.

Table V-5 presents the exposed population and area coverage size for various impacted zones of cancer risks associated with off-site diesel PM emissions.

Table V-5: Estimated Impacted Areas and Exposed Population Associated with Different Cancer Risk Levels Estimated for Off-Site Diesel PM Emissions

Estimated Cancer Risk (chances per million)	Impacted Area (Acres)	Estimated Population Exposed
10 -25	26,000	133,800
25 -50	9,100	46,300
50-100	5,700	38,800
100-250	3,700	12,750
>250	1,300	3,900
>10	**46,000***	**235,550***

*: Approximate estimates due to partial of these isopleths extend beyond the air dispersion model domain.
* Numbers may not add due to rounding.

Figure V-4: Estimated Cancer Risk Levels from Off-site Diesel PM Emissions

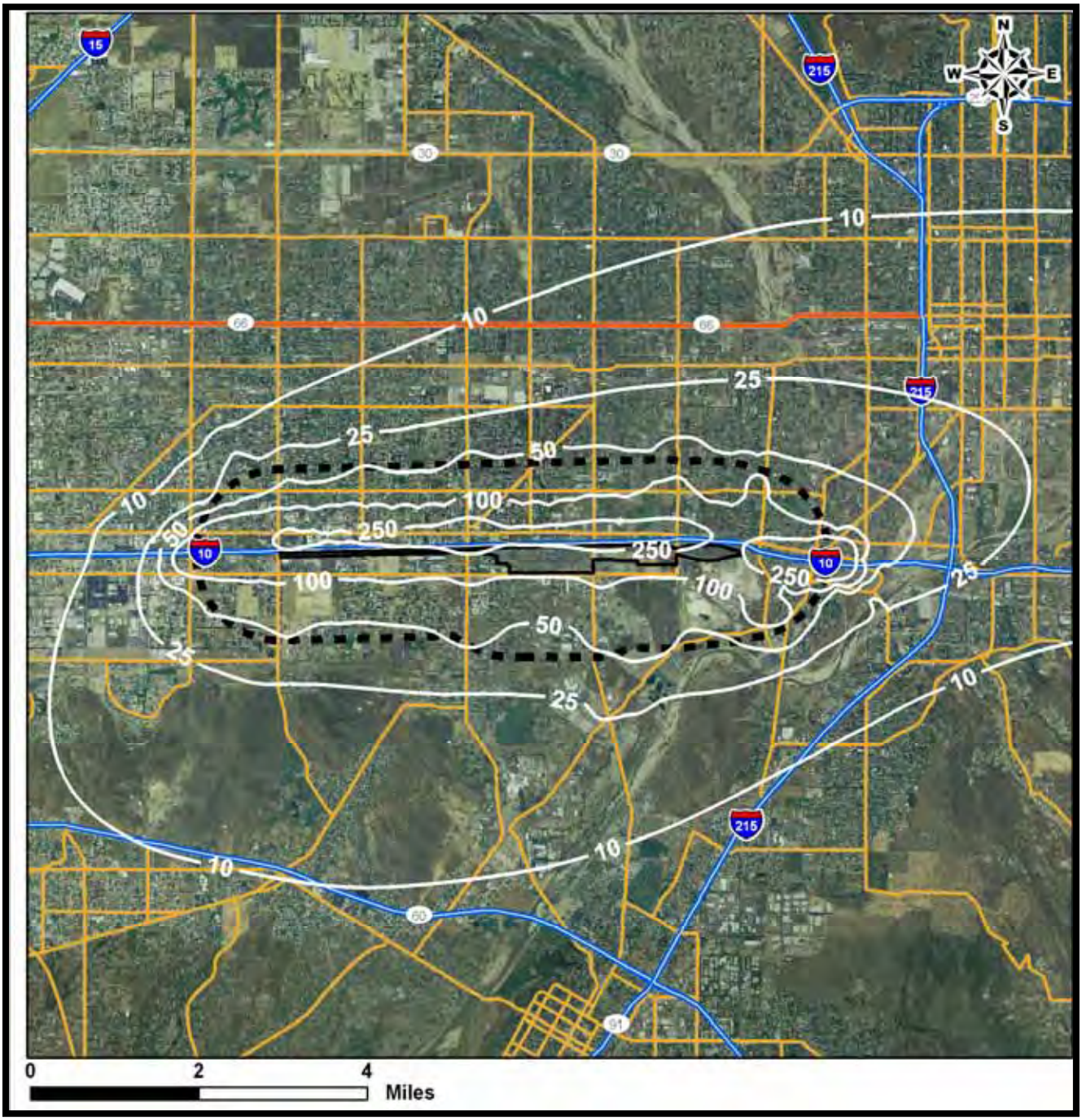


Figure V-5: Estimated Non-Cancer Chronic Health Hazard Index from Off-site Diesel PM Emissions

3. *Risks to Sensitive Receptors*

Individuals may be more sensitive to toxic exposures than the general population. These sensitive populations are identified as school-age children and seniors. The sensitive receptors include schools, hospitals, day-care centers and elder care facilities. There are 29 sensitive receptors within one-mile of the UP Colton, including 20 schools, 5 child care centers and 4 health facilities or hospitals. Table V-6 shows the number of sensitive receptors in various levels of cancer risks associated with diesel PM emission from the UP Colton Railyard, based on 70-year residential exposure duration.

Table V-6: Estimated Number of Sensitive Receptors in Various Levels of Cancer Risks associated with On-Site Diesel PM Emissions

Estimated Cancer Risk (chances per million)	Number of Sensitive Receptors
10 – 25	10
25 – 50	12
50 – 100	6
> 100	1
>10	**29**

D. Uncertainty and Limitations

Risk assessment is a complex procedure which requires the integration of many variables and assumptions. The estimated diesel PM concentrations and risk levels produced by a risk assessment are based on several assumptions, many of which are designed to be health protective so that potential risks to individual are not underestimated.

As described previously, the health risk assessment consists of three components: (1) emission inventory, (2) air dispersion modeling, and (3) risk assessment. Each component has a certain degree of uncertainty associated with its estimation and prediction due to the assumptions made. Therefore, there are uncertainties and limitations with the results.

The following subsections describe the specific sources of uncertainties in each component. In combination, these various factors may result in potential uncertainties in the location and magnitude of predicted concentrations, as well as the potential health effects actually associated with a particular level of exposure.

1. *Emission Inventory*

The emission rate often is considered to be proportional to the type and magnitude of the activity at a source, e.g., the operation. Ideally, emissions from a source can be calculated on the basis of measured concentrations of the pollutant in the sources and emission strengths, e.g., a continuous emission monitor. This approach can be very costly and time consuming and is not often used for the emission estimation. Instead,

emissions are usually estimated by the operation activities or fuel consumption and associated emission factors based on source tests.

The uncertainties of emission estimates may be attributed to many factors such as a lack of information for variability of locomotive engine type, throttle setting, level of maintenance, operation time, and emission factor estimates. Quantifying individual uncertainties is a complex process and may in itself introduce unpredictable uncertainties[6].

For locomotive sources at the UP Colton Railyard, the activity rates include primarily the number of engines in operation and the time spent in different power settings. The methodology used for the locomotive emissions is based on these facility-specific activity data. The number of engines operating in the facility is generally well-tallied by UP's electronic monitoring of locomotives entering and leaving the railyard. However, the monitoring under certain circumstances may produce duplicate readings that can result in overestimates of locomotive activity. In addition to recorded activity data, surveys and communications with facility personnel, and correlations from other existing data, (e.g., from the Roseville Railyard Study (ARB, 2004a)), all were used to verify the emission estimations in the emission inventory.

Uncertainties also exist in estimates of the engine time in mode. Idling is typically the most significant operational mode, but locomotive event recorder data could not distinguish when an engine is on or off during periods when the locomotive is in the idle notch. As a result, a professional judgment is applied to distinguish between these two modes. While the current operations may not be precisely known, control measures already being implemented are expected to result in reduced activity levels and lower emissions than are estimated here for future years.

As discussed previously, emission factors are often used for emission estimates according to different operating cycles. The Roseville Railyard Study (ARB, 2004) developed representative diesel PM emission factors for locomotives in different duty

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[6] The railyard HRAs have been performed using a methodology according to the ARB's and OEHHA Guidelines, and consistent with previous health risk analyses conducted by ARB. Similar to any model with estimations, the primary barriers of an HRA to determine objective probabilities are lack of adequate scientific understanding and more precise levels of data. Subjective probabilities are also not always available.

Tier-1 methodology is a conservative point approach but suitable for current HRA's scope, given the condition and lack of probability data. Tier-1 approach used in the HRAs is consistent with previous health risk analyses performed by ARB, "*The Roseville Railyard Study* (ARB, 2004)" and "*Diesel PM Exposure Assessment Study for the Ports of Los Angeles and Long Beach* (ARB, 2006b)". By recognizing associated uncertainties or variability, the HRAs have qualitatively discussed the limitation and caveats of possible underestimation and overestimation in emission inventory and modeling predictions because of assumptions and simplifications. The discussion provides an additional reference for HRA results even though quantitative uncertainty bounds are unavailable. Most importantly, it is not practical to characterize and quantify the uncertainty of estimated health risks without the support of robust scientific data and actual probability distribution functions of model variables. An attempt to incorporate subjective judgments on uncertainty analyses can lead to misinterpretation of HRA findings.

cycles. To reduce the possible variability of locomotive population and the uncertainty from assumptions, the emission factors were updated in the study to cover a wide range of locomotive fleet in the State (see Appendix D). These critical updates for locomotive emission inventory have established the most representative locomotive emission factors for the study.

For non-locomotive emissions, uncertainty associated with vehicles and equipment at the railyard facility also exists because the duty cycles (i.e., engine load demanded) are less well characterized. Default estimates of the duty cycle parameters may not accurately reflect the typical duty demanded from these vehicles and equipment at any particular site. In addition, national and state regulations have targeted these sources for emission reductions. Implementation of these rules and fleet turnover to newer engines meeting more strict standards should significantly reduce emissions at these rail sites in future years. However, the effects of these regulations have not been incorporated in the emission estimates, so estimated emissions are greater than those expected for future years at the same activity level.

2. *Air Dispersion Modeling*

An air dispersion model is derived from atmospheric diffusion theory with assumptions or, alternatively, by solution of the atmospheric-diffusion equation assuming simplified forms of effective diffusivity. Within the limits of the simplifications involved in its derivation, the model-associated uncertainties are vulnerably propagated into its downstream applications.

Model uncertainty may stem from data gaps that are filled by the use of assumptions. Uncertainty is often considered as a measure of the incompleteness of one's knowledge or information about a variate whose true value could be established if a perfect measurement is available. The structure of mathematical models employed to represent scenarios and phenomena of interest is often a key source of model uncertainty, due to the fact that models are often only a simplified representation of a real-world system, such as the limitation of model formulation, the parameterization of complex processes, and the approximation of numerical calculations. These uncertainties are inherent and exclusively caused by the model's inability to represent a complex aerodynamic process. An air dispersion model usually uses simplified atmospheric conditions to simulate pollutant transport in the air, and these conditions become inputs to the models (e.g., the use of non site-specific meteorological data, uniform wind speed over the simulating domain, use of surface parameters for the meteorological station as opposed to the railyard, substitution of missing meteorological data, and simplified emission source representation). There are also other physical dynamics in the transport process, such as the small-scale turbulent flow in the air, which are not characterized by the air dispersion models. As a result of the simplified representation of real-world physics, deviations in pollutant concentrations predicted by the models may occur due to the introduced uncertainty sources.

The other type of uncertainty is referred as reducible uncertainty, a result of uncertainties associated with input parameters of the known conditions, which include source characteristics and meteorological inputs. However, the uncertainties in air

dispersion models have been improved over the years because of better representations in the model structure. In 2006, the U.S. EPA modeling guidance was updated to replace the Industrial Source Complex model with AERMOD as a recommended regulatory air dispersion model for determining single source and source complex. Many updated formulations have been incorporated into the model structure from its predecessor, ISCST3, for better predictions from the air dispersion process. Nevertheless, quantifying overall uncertainty of model predictions is infeasible due to the associated uncertainties described above, and is beyond the scope of this study.

3. *Risk Assessment*

The toxicity of toxic air contaminants is often established by available epidemiological studies, or, where data from humans are not available, the use of data from animal studies. The diesel PM cancer potency factor is based on long-term study of railyard workers exposed to diesel exhaust at concentrations approximately ten times typical ambient exposures (OEHHA, 2003). The differences within human populations usually cannot be easily quantified and incorporated into risk assessments. The differences within human populations usually cannot be easily quantified and incorporated into risk assessments. Factors including metabolism, target site sensitivity, diet, immunological responses, and genetics may influence the response to toxicants. In addition, the human population is much more diverse both genetically and culturally (e.g., lifestyle, diet) than inbred experimental animals. The variability among humans is expected to be much greater than in laboratory animals. Adjustment for tumors at multiple sites induced by some carcinogens could result in a higher potency. Other uncertainties arise (1) in the assumptions underlying the dose-response model used, and (2) in extrapolating from large experimental doses, where, for example, other toxic effects may compromise the assessment of carcinogenic potential due to much smaller environmental doses. Also, only single tumor sites induced by a substance are usually considered. When epidemiological data are used to generate a carcinogenic potency, less uncertainty is involved in the extrapolation from workplace exposures to environmental exposures. However, children, a subpopulation who's hematological, nervous, endocrine, and immune systems are still developing and who may be more sensitive to the effects of carcinogens on their developing systems, are not included in the worker population and risk estimates based on occupational epidemiological data are more uncertain for children than adults.

Human exposures to diesel PM are often based on limited availability of data and are mostly derived based on estimates of emissions and duration of exposure. Different epidemiological studies also suggest somewhat different levels of risk. When the Scientific Review Panel (SRP) identified diesel PM as a toxic air contaminant (ARB, 1998), the panel members endorsed a range of inhalation cancer potency factors (1.3×10^{-4} to 2.4×10^{-3} $(\mu g/m^3)^{-1}$) and a risk factor of 3×10^{-4} $(\mu g/m^3)^{-1}$, as a reasonable estimate of the unit risk. From the unit risk factor an inhalation cancer potency factor of 1.1 $(mg/kg\text{-}day)^{-1}$ can be calculated, which is used in the study. There are many epidemiological studies that support the finding that diesel exhaust exposure elevates relative risk for lung cancer. However, the quantification of each uncertainty applied in the estimate of cancer potency is very difficult and can be itself uncertain

This study adopts the standard Tier 1 approach recommended by the OEHHA for exposure and risk assessment. A Tier 1 approach is an end-point estimate methodology without the consideration of site-specific data distributions. It also assumes that an individual is exposed to an annual average concentration of a pollutant continuously for a specific time period. The OEHHA recommends the lifetime 70-year exposure duration with a 24-hour per day exposure be used for determining residential cancer risks. This will ensure a person residing in the vicinity of a facility for a lifetime will be included in the evaluation of risk posed by the facility. Lifetime 70-year exposure is a conservative estimate, but it is a historical benchmark for comparing facility impacts on receptors and for evaluating the effectiveness of air pollution control measures. Although it is not likely that most people will reside at a single residence for 70 years, it is common that people will spend their entire lives in a major urban area. While residing in urban areas, it is very possible to be exposed to the emissions of another facility at the next residence. In order to help ensure that people do not accumulate an excess unacceptable cancer risk from cumulative exposure to stationary facilities at multiple residences, the 70-year exposure duration is used for risk management decisions. However, if a facility is notifying the public regarding health risk, it is a useful indication for a person who has resided in his or her current residence less than 70 years to know that the calculated estimate of his or her cancer risk is less than that calculated for a 70-year risk (OEHHA, 2003). It is important that the risk estimates generated in this study not be interpreted as the expected rates of disease in the exposed population, but rather as estimates of potential risk. Risk assessment is best viewed as a comparative tool rather than a literal prediction of diesel incidence in a community.

Moreover, since the Tier-1 methodology is used in the study for the health risk assessment, the results have been limited to deterministic estimates based on conservative inputs. For example, an 80th percentile breathing rate approach is used to represent a 70-year lifetime inhalation that tends toward the high end for the general population. Moreover, the results based on the Tier-1 estimates do not provide an indication of the magnitude of uncertainty surrounding the quantities estimated, nor an insight into the key sources of underlying uncertainty.

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APPENDIX A

METHODOLOGY FOR ESTIMATING OFF-SITE DIESEL PM MOBILE SOURCE EMISSIONS

INTRODUCTION

This assessment includes on-road mobile emissions from all heavy duty diesel truck running exhaust as it is the primary source of diesel particulate emissions within the on-road vehicle fleet. Traditionally, on-road mobile emission inventories are generated at the county scale using California's emission factor model EMFAC and then allocated to large grid cells using the Direct Travel Impact Model (DTIM). To enhance the spatial resolution we have estimated emissions based on roadway specific vehicle activity data and allocated them to individual roadway links. All roadway links within a mile buffer of the combined Commerce yards and all links within a 1-mile buffer of all other yards were included in this assessment.

As more and more work has been done to understand transportation modeling and forecasting, access to local scale vehicle activity data has increased. For example, the various Metropolitan Planning Organizations (MPOs) are mandated by the Federal government to maintain a regional transportation plan and regional transportation improvement plan. These reports assess the impact the travel growth and assess various transportation improvement plans[1]. Planning is based on travel activity results from Transportation Demand Models (TDMs) that forecast traffic volumes and other characteristics of the transportation system. Currently, more than a dozen MPOs as well as the California Department of Transportation (Caltrans) maintain transportation demand models. Through a system of mathematical equations TDMs estimate vehicle population and activity estimates such as speed and vehicle miles traveled (VMT) based on data about population, employment, surveys, income, roadway and transit networks and transportation costs. The activity is then assigned a spatial and temporal distribution by allocating them to roadway links and time periods. A roadway link is defined as a discrete section of roadway with unique estimates for the fleet specific population and average speed and is classified as a freeway, ramp, major arterial, minor arterial, collector, or centroid connector. Link based emission inventory development utilizes these enhanced spatial data and fleet and pollutant specific emission factors to estimate emissions at the neighborhood scale.

METHODOLOGY

Estimating emissions from on-road mobile sources outside the rail yards was broken into four main processes and described below. The first step involves gathering vehicle activity data specific to each link on the roadway network. Each link contains 24 hours worth of activity data including vehicle miles traveled, vehicle type, and speed. The activity is then apportioned to the various heavy duty diesel truck types (Table 1) where speed-specific VMT is then matched to an emission factor from EMFAC to estimate total emissions from each vehicle type for each hour of the day. The working draft of EMFAC (version V2.23.7), rather than EMFAC2007, was used for this assessment because at the time this project was underway EMFAC2007 was not completed. The working draft of EMFAC (version V2.23.7), however, contains nearly all the revisions in EMFAC2007 that would affect these calculations.

Table 1: Heavy Duty Truck Categories

Class	Description	Weight (GVW)	Abbreviation	Technology Group
T4	Light-Heavy Duty Diesel Trucks	8,501-10,000	LHDDT1	DIESEL
T5	Light-Heavy Duty Diesel Trucks	10,001-14,000	LHDDT2	DIESEL
T6	Medium-Heavy Duty Diesel Trucks	14,001-33,000	MHDDT	DIESEL
T7	Heavy-Heavy Duty Diesel Trucks	33,001+	HHDDT	DIESEL

Step 1: Obtain Link-Specific Activity Data

The link specific activity data for heavy duty trucks necessary to estimate emissions are speed and vehicle miles traveled (VMT), where VMT is a product of vehicle volume (population) and link length. Link activity for Ventura, Los Angeles, Orange, and more than 90% of Riverside and San Bernardino counties are provided by the Southern California Association of Governments (SCAG) Heavy Duty Truck Transportation Demand Model. Heavy duty truck activity is modeled using truck specific data, commodity flows and goods movement data. SCAG, however, is the only MPO with a heavy duty truck model. The remaining counties under the rail yard study are covered by the Integrated Transportation Network (ITN) developed by Alpine Geophysics[2]. The Integrated Transportation Network was developed by stitching together MPO transportation networks and the Caltrans statewide transportation network. Link specific truck activity from the ITN is estimated as a fraction of the total traffic on the links[2] and is based on the fraction of trucks within each county as it is estimated in EMFAC.

The product of truck volume and link length is referred to as vehicle miles traveled (VMT) and has units of miles. Transportation demand models provide total VMT for each link without further classification into the various heavy duty truck weight and fuel type classifications. Therefore, in order to assess the emissions only from heavy duty diesel trucks the total heavy duty truck VMT is multiplied by the fraction of trucks that are diesel. Once the total diesel VMT is calculated the heavy duty truck diesel VMT is multiplied by the fraction of trucks that make up the four weight classifications. The fuel and weight fractions are specific to each county and are derived from total VMT for each weight and fuel class in EMFAC for each county. The data is then compiled into an activity matrix (Table 2) composed of a link identification code, hour of the day, speed, light heavy duty diesel 1 truck (LHDDT1) VMT, light heavy duty diesel 2 truck (LHDDT2) VMT, medium heavy duty diesel truck (MHDDT) VMT, and heavy-heavy duty diesel truck (HHDDT) VMT.

Table 2: Activity Matrix Example

LINKID	Hour	Speed (mph)	LHDDT1 VMT (miles)	LHDDT2 VMT (miles)	MHDDT VMT (miles)	HHDDT VMT (miles)
49761	12	45	0.37	0.48	3.17	5.51
49761	3	45	0.14	0.18	1.16	2.00
49761	3	35	0.16	0.21	1.37	2.38
50234	4	55	0.19	0.26	1.68	2.92

Step 2: Derive Gram per Mile Emission Factors

The second step of the emission inventory process involves developing emission factors for all source categories for a specified time period, emission type, and pollutant. Running exhaust emission factors based on vehicle type, fuel type and speed were developed from the Emfac mode of EMFAC. These are composite emission factors based on the model year distribution for each county and provided in units of grams of emissions per mile traveled. Emission factors are based on test cycles that reflect typical driving patterns, and non-extended idling is included.

Finally, a matrix of emission factors by speed and vehicle type was assembled for each county for light heavy-duty diesel trucks 1 and 2 (LHDDT1 and LHDDT2), medium heavy-duty diesel trucks (MHDDT) and heavy heavy-duty diesel trucks (HHDDT). The following is an example of such a matrix (Table 3):

Table 3: Emission Factor Matrix Example

	Diesel PM Emission Factors (g/mile)			
Speed (mph)	LHD1 DSL	LHD2 DSL	MHD DSL	HHD DSL
12	0.101	0.145	0.631	2.371
20	0.072	0.105	0.455	1.277
45	0.037	0.054	0.235	0.728
60	0.033	0.047	0.206	1.095

Step 3: Calculate Emissions

Diesel particulate matter (DPM) emission factors are provided as grams per mile specific to each speed and heavy duty truck type (see table above). To estimate emissions the activity for each diesel heavy duty truck type was matched to the corresponding emission factor (EF). For example, a 0.25 mile long link at 3 am in the morning has 8 heavy heavy-duty diesel trucks (HHDDTs) traveling at 45 miles per hour. This equates to a VMT of 2.00 miles (8 trucks*0.25 miles). EMFAC has provided a gram per mile emission factor for HHDDT traveling at 45 mph in Los Angeles County as 0.728 grams DPM/mile. In order to estimate total emissions from HHDDTs on that link during that hour of the day the following calculation is made:

$$TotalEmissions(grams) = EF \cdot (Volume \cdot LinkLength) = EF \cdot VMT$$

$$TotalEmissions(grams) = EF \cdot VMT = 0.728 \frac{grams}{mile} \cdot 2.00 miles = 1.45 grams$$

The steps outlined above and in Steps 1 and 2 can be represented with this single equation that provides an emissions total for each link for each hour of the day.

$$Emissions = VMT_{link} \cdot \sum_{i,j} Fraction_{i,j} \cdot EF_{i,j}$$

where

- Emissions – the total emissions in grams for each link
- i = represents the individual diesel heavy duty truck types (LHDDT1, LHDDT2 – light heavy duty diesel trucks 1 and 2; MHDDT – medium heavy duty diesel truck; and HHDDT – heavy-heavy duty diesel truck)
- j – represent the hours of the day (hours 1-24)
- VMT_{Link} - total VMT for that link for all heavy duty trucks (gasoline and diesel)
- Fraction = the fraction of the VMT that is attributable to each diesel heavy duty truck type The fraction is estimated based on VMT estimates in EMFAC:
  Example: $VMT_{MHDDT}/VMT_{\text{all heavy duty trucks (gasoline \& diesel)}}$
- EF = the heavy duty diesel truck emission factors. The emission factor is vehicle type and speed specific and is thus matched according to the link specific activity parameters.

From this expression diesel particulate matter emissions are provided for each link and for each hour of the day. Finally, emissions are summed for all links for all hours of the day to provide a total daily emission inventory.

Step 4: QA/QC – Quality Assurance/Quality Control

To assure that the total emissions were calculated correctly the total emissions (grams) were divided by the total diesel VMT to estimate a composite diesel gram per mile emission factor. This back-calculated emission factor was checked against emission factors in EMFAC. In addition, where possible, heavy duty truck gate counts provided for the rail yards were checked against traffic volumes on the links residing by the gates.

Limitations and Caveats

We have made several important assumptions in developing this inventory. While these assumptions are appropriate at the county level they may be less appropriate for the particular areas modeled in this assessment. For example, the county specific default model year distribution within EMFAC and vehicle type VMT fractions were assumed to be applicable for all links within the domain modeled. In the vicinity of significant heavy heavy-duty truck trip generators, it is reasonable to expect that surrounding links will also have higher heavy heavy-duty truck fractions. In these cases, using EMFAC county vehicle mix fractions may underestimate the total diesel particulate emissions from on-road heavy duty trucks. In this inventory, EMFAC county defaults were employed as there is insufficient data available to assess the vehicle mix fractions surrounding the railyards.

Travel demand model results are checked by comparing actual traffic counts on links where the majority of vehicle travel takes place. Therefore, there will be greater uncertainty associated with activity from minor arterials, collectors, and centroid connectors than from higher volume freeways. Data based strictly on actual traffic counts for each street would provide better activity estimates, but unfortunately very little data is available for such an analysis. While links representing freeways are accurately allocated spatially, the allocation of neighborhood streets and other minor roads are not as well represented.

The emissions inventory developed for this study only included diesel particulate matter emissions from running exhaust as it is the primary diesel source from on-road mobile sources. Emissions from other modes such as extended idling, starts, and off-road equipment outside the rail yards were excluded. Vehicle activity from distribution centers, rail yards and ports, however, are included as they are captured on the roadway network by the travel demand models.

REFERENCES

1. “SCAG Transportation Modeling”, http://www.scag.ca.gov/modeling/ [Accessed January 2007].
2. Wilkinson, James (Alpine Geophysics); et al. “Development of the California Integrated Transportation Network (ITN),” Alpine Geophysics – Atmospheric and Hydrologic Sciences, La Honda, CA (2004). http://www.arb.ca.gov/airways/CCOS/docs/III3_0402_Jun06_fr.pdf

APPENDIX B

METHODOLOGY FOR ESTIMATING OFF-SITE DIESEL PM STATIONARY SOURCE EMISSIONS

Emissions from off-site stationary source facilities were identified using the California Emission Inventory Development and Reporting System (CEIDARS) database, which contains information reported by the local air districts for stationary sources within their jurisdiction.

Geographic information system (GIS) mapping tools were used to create a one-mile buffer zone outside the property boundary footprint reported for each railyard. The CEIDARS facilities whose latitude/longitude coordinates fell within the one-mile buffer zone were selected. Because of the close proximity of railyards in the Commerce area, the four railyards (Commerce-BNSF, Commerce-UP-Main, Commerce-UP-Eastern, and Commerce-UP-Mechanical/Sheila) were enclosed in a combined polygon outline, and a two-mile buffer zone was then used around the combined polygon footprint.

The reported criteria pollutants in CEIDARS include carbon monoxide, nitrogen oxides, sulfur oxides, total organic gases, and particulate matter (PM). The reported toxic pollutants include the substances and facilities covered by the Air Toxics “Hot Spots” (AB 2588) program. Diesel exhaust particulate matter (diesel PM) was estimated from stationary internal combustion (IC) engines burning diesel fuel, operating at stationary sources reported in CEIDARS. Diesel PM emissions were derived from the reported criteria pollutant PM that is ten microns or less in diameter (criteria pollutant PM10) emitted from these engines. In a few cases, diesel exhaust PM was reported explicitly under the “Hot Spots” reporting provisions as a toxic pollutant, but generally the criteria pollutant PM10 reported at diesel IC engines was more comprehensive than the toxics inventory, and was, therefore, the primary source of data regarding diesel PM emissions.

The CEIDARS emissions represent annual average emission totals from routine operations at stationary sources. For the current analysis, the annual emissions were converted to grams per second, as required for modeling inputs for cancer and chronic non-cancer risk evaluation, by assuming uniform temporal operation during the year. (The available, reported emission data for acute, maximum hourly operations were insufficient to support estimation of acute, maximum hour exposures).

The CEIDARS 2004 database year was used to provide the most recent data available for stationary sources. Data for emissions, location coordinates, and stack/release characteristics were taken from data reported by the local air districts in the 2004 CEIDARS database wherever available. However, because micro-scale modeling requires extensive information at the detailed device and stack level that has not been routinely reported, historically, by many air districts, much of the stack/release information is not in CEIDARS. Gaps in the reported data were addressed in the following ways. Where latitude/longitude coordinates were not reported for the stack/release locations, prior year databases were first searched for valid coordinates, which provided some additional data. If no other data were available, then the coordinates reported for the overall facility were applied to the stack locations. Where parameters were not complete for the stack/release characteristics (i.e., height, diameter, gas temperature and velocity), prior year databases were first searched for valid data. If no reported parameters were available, then U.S. EPA stack defaults from

the Emissions Modeling System for Hazardous Air Pollutants (EMS-HAP) program were assigned. The U.S. EPA stack defaults are assigned based on the Source Classification Code (SCC) or Standard Industrial Classification (SIC) code of the operation. If an applicable U.S. EPA default was not available, then a final generic default was applied. To ensure that the micro-scale modeling results would be health-protective, the generic release parameters assumed relatively low height and buoyancy. Two generic defaults were used. First, if the emitting process was identifiable as a vent or other fugitive-type release, the default parameters assigned were a height of five feet, diameter of two feet, temperature of 100 degrees Fahrenheit, and velocity of 25 feet per second. For all remaining unspecified and unassigned releases, the final generic default parameters assigned were a height of twenty feet, diameter of two feet, temperature of 100 degrees Fahrenheit, and velocity of 25 feet per second. All English units used in the CEIDARS database were converted to metric units for use in the micro-scale modeling input files.

APPENDIX C

SUMMARY OF AIR DISPERSION MODELING RESULTS FROM OFF-SITE DIESEL PM EMISSIONS

Impacts from Off-site Diesel PM (DPM) Sources for the UP Colton RailYard, Bloomington, CA

Impacts from off-site pollution sources near the UP Colton rail yard facility were modeled using the USEPA-approved AERMOD dispersion model version 04300. Specifically, off-site mobile and stationary diesel PM (DPM) emission sources located out to a distance of one mile from the perimeter of the UP Colton railyard was included.

To facilitate modeling of these off-site emission sources, the information summarized in Table 1 was provided by external sources.

Table 1. Data Provided by Others for Off-Site Emission Source Modeling.

Type of Data	Description	Data Source
Emission Estimates	Off-site DPM emissions for 2005 Mobile Sources: 41.9 TPY DPM Stationary Sources: 1.5 TPY DPM	PTSD/MSAB
Receptor Grid	41x41 Cartesian grid covering 400 km^2 with uniform spacing of 500 meters. Grid origin: (455000, 3760000) in UTM Zone 11.	Sierra Research
Meteorological Data	AERMET-Processed data for 1999 *Surface*: Ontario Intl. Airport *Upper Air*: San Diego Miramar	Sierra Research
Surface Data	Albedo: *Not provided** Bowen Ratio: *Not provided** Surface Roughness: *Not provided**	Sierra Research

*Surface parameters were defined by the consultants during the AERMET meteorological pre-processing. However, only the AERMET model-ready output files, which do not contain these parameters, were provided by Sierra Research.

The spatial and temporal emissions provided for these sources were converted into the appropriate AERMOD ready files. The off-site emissions were modeled using the same coarse receptor grid and meteorological data used by the consultants for their rail yard model runs, as indicated in the table above.

Figure 1: Region surrounding the UP Colton rail facility with the modeling domain indicated by the black outline.

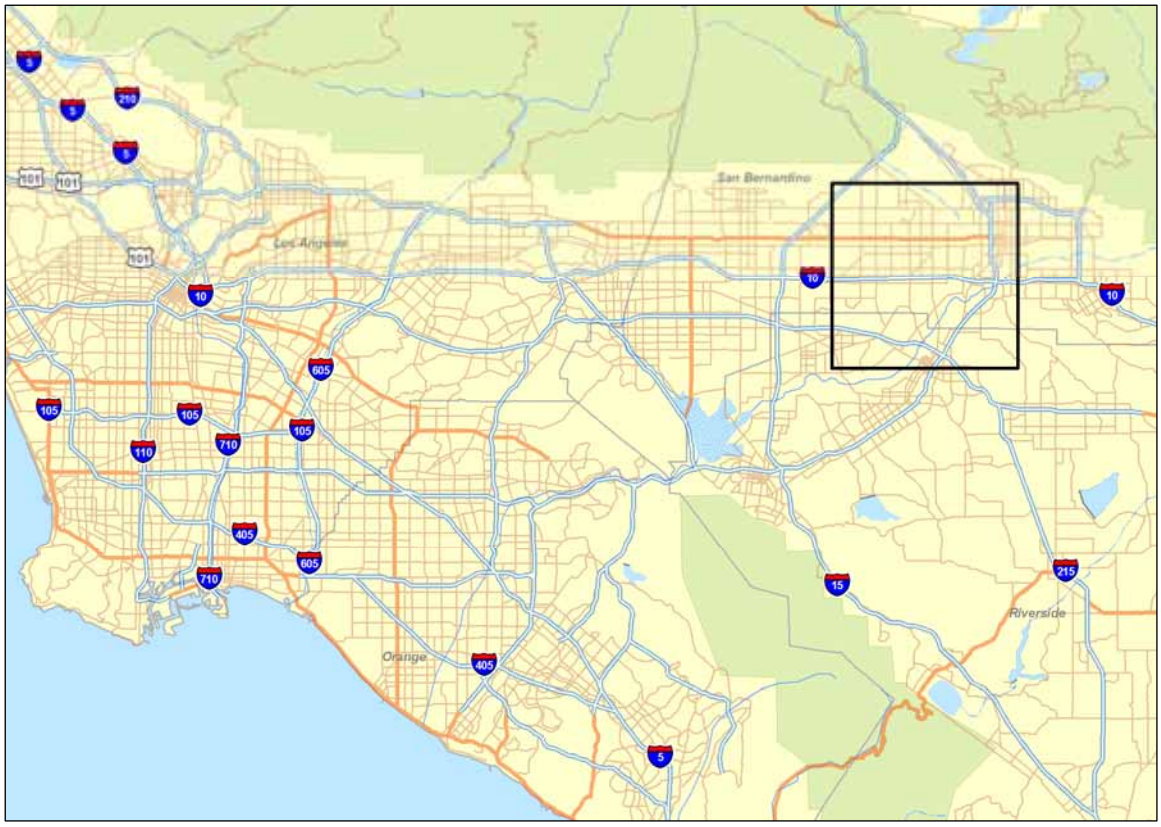
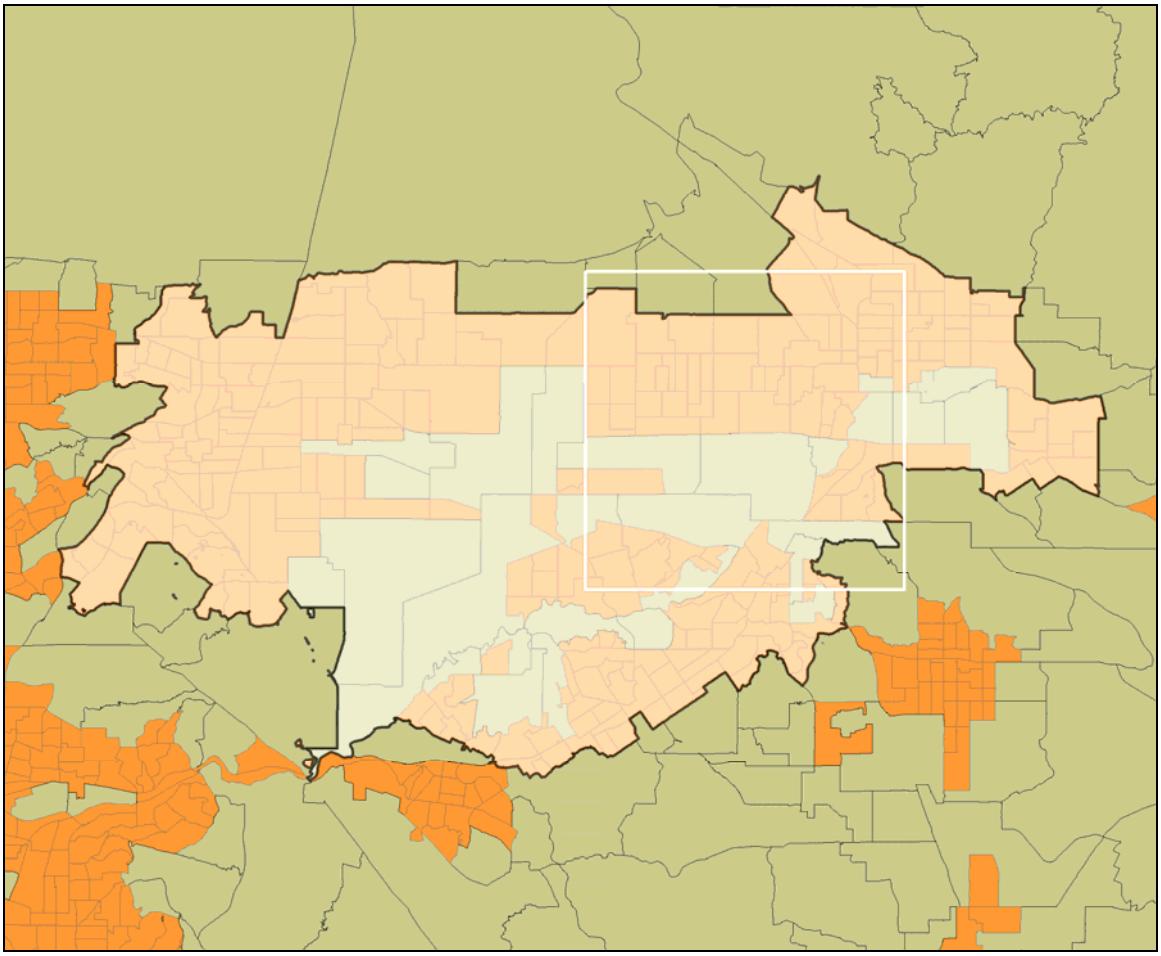


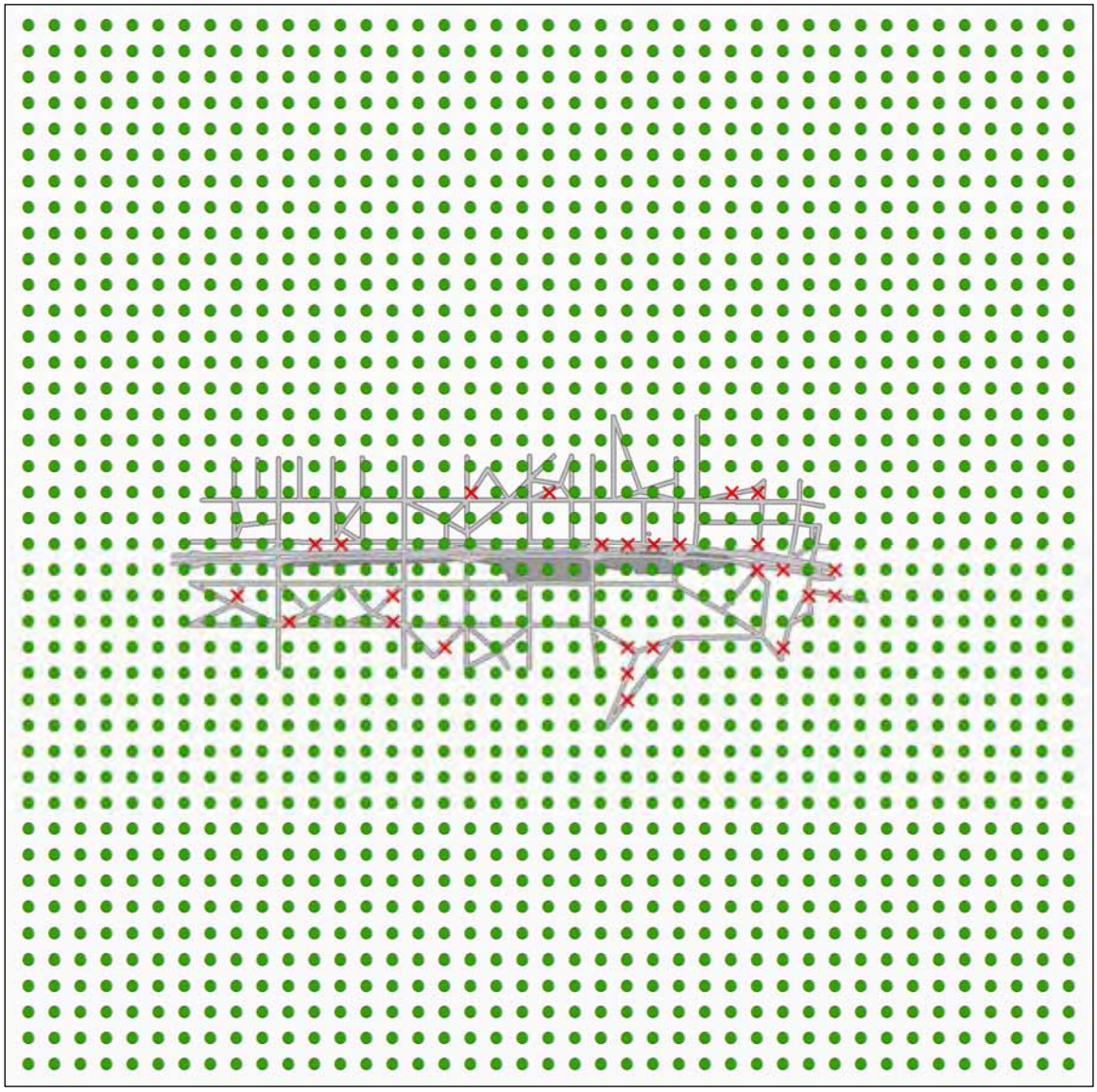
Figure 1 illustrates the region surrounding the UP Colton modeling domain. The domain has dimensions 20 km x 20 km and contains a grid of 1681 receptors with 500 meter uniform grid spacing.

Figure 2: UP Colton Urban Population: Orange (dark) denotes areas with at least 750 people/km^2. The highlighted region is the contiguous urban area used for modeling purposes.



AERMOD requires an estimate of the urban population for urban source modeling. The urban population parameter was determined by estimating the area of continuous urban features as defined by the model guidelines (AERMOD Implementation Guide September 27, 2005). According to the guidelines, areas with a population of at least 750 people per square kilometer are considered urban. The UP Colton model domain is in a region with considerable urbanization. The continuous urban area selected can be seen in Figure 2. The population in this selected area is 1,029,675.

Figure 3: UP Colton receptor network including off-site sources and rail facility



The off-site stationary and on-road emission sources used in the UP Colton model runs are plotted along with the receptor network in Figure 3. These sources do not represent all stationary and roadway sources within the domain, but rather a subset made up of those roadways and facilities within one mile of the perimeter of the rail yard facility. Diesel PM off-site emissions used in the off-site modeling runs consisted of 41.9 tons per year from roadways and 1.5 tons per year from stationary facilities, representing emissions for 2005. Roadway emissions were simulated as AERMOD area sources with an aspect ratio of no greater than 100 to 1, with a width of 7.3 meters and a release height of 4.15 meters.

As indicated above, Figure 3 illustrates a 20 km x 20 km gridded receptor field with uniform 500 meter spacing of receptors that are plotted as "●". Because a uniform grid sometimes places receptors on a roadway, those within 35 meters of a roadway were omitted. The basis for this is that these receptors are likely to fall on the roadway

surface, versus a dwelling or workplace, and have high model-estimated concentrations, which could skew average concentration isopleths. Locations where receptors were removed are displayed as an "x" in Figure 3. After removal, 1655 of the original 1681 receptors remained.

The same meteorological data used by Sierra Research were used for the off-site modeling runs. The data were compiled by Sierra Research from the Ontario International Airport (34.06°N, 117.61°W). Upper air data for the same time period were obtained from the San Diego Miramar upper air station (32.833°N, 117.117°W). The model runs used one year of meteorological data from 1999.

Figure 4: UP Colton off-site sources and rail yard with modeled annual average concentrations from off-site sources in ug/m^3

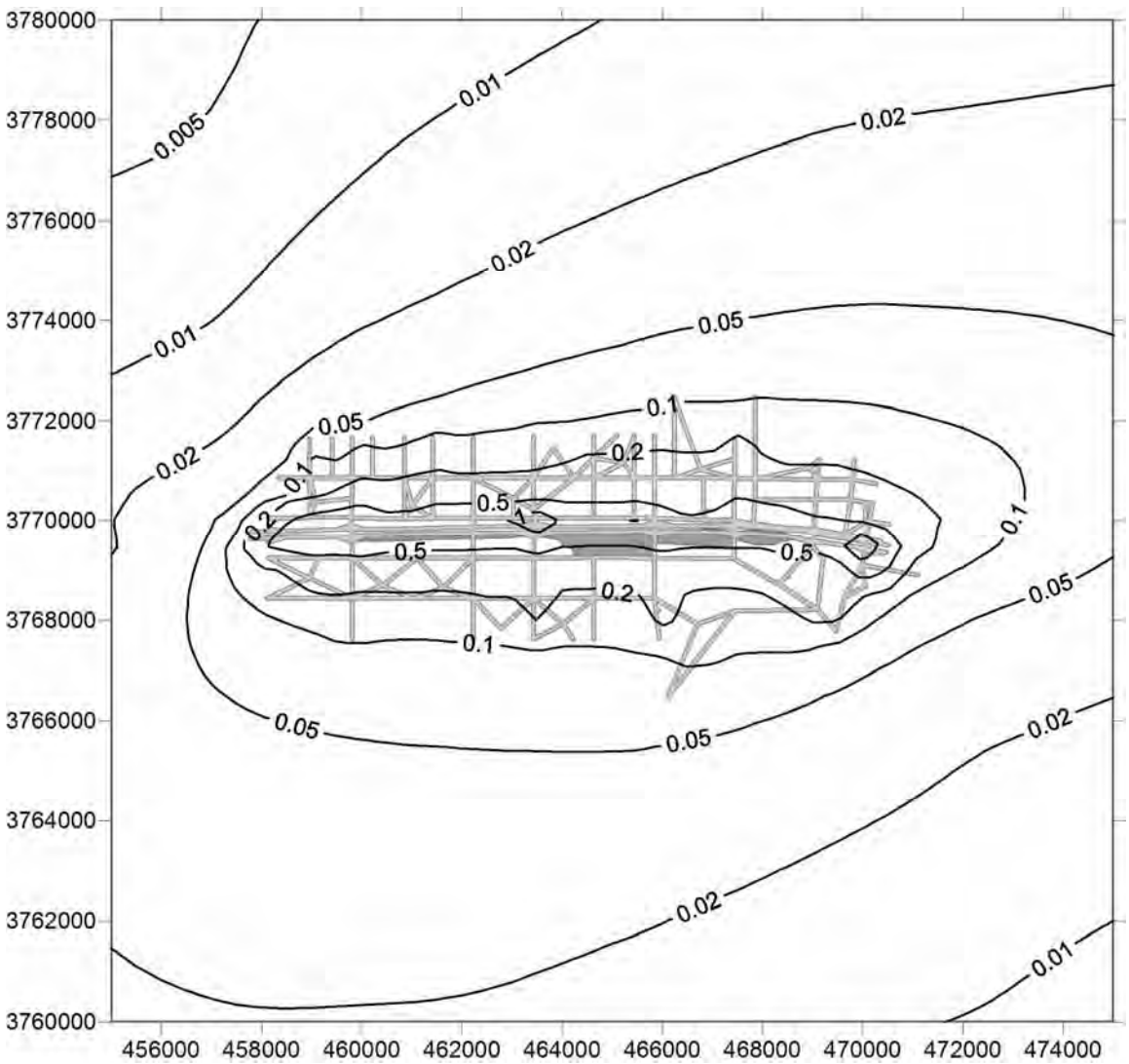


Figure 4 shows annual average diesel PM concentrations from the off-site emissions. Highest values occur near major freeways; the five highest concentrations at a receptor and their locations are provided in Table 2.

Table 2: UP Colton maximum annual concentrations in ug/m^3

X	Y	Mobile	Stationary	Total Off-site
470000	3769500	1.546	0.018	1.564
463500	3770000	1.420	0.003	1.423
465500	3770000	1.005	0.010	1.015
463000	3770000	1.005	0.003	1.008
465000	3770000	0.957	0.007	0.964

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APPENDIX D

TABLES OF LOCOMOTIVE DIESEL PM EMISSION FACTORS

Locomotive Diesel PM Emission Factors (g/hr)
Adjusted for Fuel Sulfur Content of 221 ppmw

Model Group	Tier	Throttle Setting										Source[1]
		Idle	DB	N1	N2	N3	N4	N5	N6	N7	N8	
Switchers	N	31.0	56.0	23.0	76.0	129.2	140.6	173.3	272.7	315.6	409.1	EPA RSD[1]
GP-3x	N	38.0	72.0	31.0	110.0	174.1	187.5	230.2	369.1	423.5	555.1	EPA RSD[1]
GP-4x	N	47.9	80.0	35.7	134.3	211.9	228.6	289.7	488.5	584.2	749.9	EPA RSD[1]
GP-50	N	26.0	64.1	51.3	142.5	282.3	275.2	339.6	587.7	663.5	847.2	EPA RSD[1]
GP-60	N	48.6	98.5	48.7	131.7	266.3	264.8	323.5	571.6	680.2	859.8	EPA RSD[1]
GP-60	0	21.1	25.4	37.6	75.5	224.1	311.5	446.4	641.6	1029.9	1205.1	SwRI[2] (KCS733)
SD-7x	N	24.0	4.8	41.0	65.7	146.8	215.0	276.8	331.8	434.7	538.0	SwRI[3]
SD-7x	0	14.8	15.1	36.8	61.1	215.7	335.9	388.6	766.8	932.1	1009.6	GM EMD[4]
SD-7x	1	29.2	31.8	37.1	66.2	205.3	261.7	376.5	631.4	716.4	774.0	SwRI[5] (NS2630)
SD-7x	2	55.4	59.5	38.3	134.2	254.4	265.7	289.0	488.2	614.7	643.0	SwRI[5] (UP8353)
SD-90	0	61.1	108.5	50.1	99.1	239.5	374.7	484.1	291.5	236.1	852.4	GM EMD[4]
Dash 7	N	65.0	180.5	108.2	121.2	306.9	292.4	297.5	255.3	249.0	307.7	EPA RSD[1]
Dash 8	0	37.0	147.5	86.0	133.1	248.7	261.6	294.1	318.5	347.1	450.7	GE[4]
Dash 9	N	32.1	53.9	54.2	108.1	187.7	258.0	332.5	373.2	359.5	517.0	SwRI 2000
Dash 9	0	33.8	50.7	56.1	117.4	195.7	235.4	552.7	489.3	449.6	415.1	Average of GE & SwRI[6]
Dash 9	1	16.9	88.4	62.1	140.2	259.5	342.2	380.4	443.5	402.7	570.0	SwRI[2] (CSXT595)
Dash 9	2	7.7	42.0	69.3	145.8	259.8	325.7	363.6	356.7	379.7	445.1	SwRI[2] (BNSF 7736)
C60-A	0	71.0	83.9	68.6	78.6	237.2	208.9	247.7	265.5	168.6	265.7	GE[4] (UP7555)

Notes:
1. EPA Regulatory Support Document, *Locomotive Emissions Regulation, Appendix B*, 12/17/1997, as tabulated by ARB and ENVIRON.
2. Base emission rates provided by ENVIRON as part of the BNSF analyses for the Railyard MOU (Personal communication from Chris Lindhjem to R. Ireson, 2006) based on data produced in the AAR/SwRI Exhaust Plume Study (Personal communication from Steve Fritz to C. Lindhjem, 2006).
3. SwRI final report *Emissions Measurements – Locomotives* by Steve Fritz, August 1995.
4. Manufacturers' emissions test data as tabulated by ARB.
5. Base SD-70 emission rates taken from data produced in the AAR/SwRI Exhaust Plume Study (Personal communication from Steve Fritz to R. Ireson, 2006).
6. Average of manufacturer's emissions test data as tabulated by ARB and data from the AAR/SwRI Exhaust Plume Study, tabulated and calculated by ENVIRON.

Locomotive Diesel PM Emission Factors (g/hr)
Adjusted for Fuel Sulfur Content of 2,639 ppmw

Model Group	Tier	Throttle Setting										Source[1]
		Idle	DB	N1	N2	N3	N4	N5	N6	N7	N8	
Switchers	N	31.0	56.0	23.0	76.0	136.9	156.6	197.4	303.4	341.2	442.9	EPA RSD[1]
GP-3x	N	38.0	72.0	31.0	110.0	184.5	208.8	262.2	410.8	457.9	601.1	EPA RSD[1]
GP-4x	N	47.9	80.0	35.7	134.3	224.5	254.6	330.0	543.7	631.6	812.1	EPA RSD[1]
GP-50	N	26.0	64.1	51.3	142.5	299.0	306.5	386.9	653.9	717.3	917.4	EPA RSD[1]
GP-60	N	48.6	98.5	48.7	131.7	282.1	294.9	368.5	636.1	735.4	931.0	EPA RSD[1]
GP-60	0	21.1	25.4	37.6	75.5	237.4	346.9	508.5	714.0	1113.4	1304.9	SwRI[2] (KCS733)
SD-7x	N	24.0	4.8	41.0	65.7	155.5	239.4	315.4	369.2	469.9	582.6	SwRI[3]
SD-7x	0	14.8	15.1	36.8	61.1	228.5	374.1	442.7	853.3	1007.8	1093.2	GM EMD[4]
SD-7x	1	29.2	31.8	37.1	66.2	217.5	291.5	428.9	702.6	774.5	838.1	SwRI[5] (NS2630)
SD-7x	2	55.4	59.5	38.3	134.2	269.4	295.9	329.2	543.3	664.6	696.2	SwRI[5] (UP8353)
SD-90	0	61.1	108.5	50.1	99.1	253.7	417.3	551.5	324.4	255.3	923.1	GM EMD[4]
Dash 7	N	65.0	180.5	108.2	121.2	352.7	323.1	327.1	293.7	325.3	405.4	EPA RSD[1]
Dash 8	0	37.0	147.5	86.0	133.1	285.9	289.1	323.3	366.4	453.5	593.8	GE[4]
Dash 9	N	32.1	53.9	54.2	108.1	215.7	285.1	365.6	429.3	469.7	681.2	SwRI 2000
Dash 9	0	33.8	50.7	56.1	117.4	224.9	260.1	607.7	562.9	587.4	546.9	Average of GE & SwRI[6]
Dash 9	1	16.9	88.4	62.1	140.2	298.2	378.1	418.3	510.2	526.2	751.1	SwRI[2] (CSXT595)
Dash 9	2	7.7	42.0	69.3	145.8	298.5	359.9	399.8	410.4	496.1	586.4	SwRI[2] (BNSF 7736)
C60-A	0	71.0	83.9	68.6	78.6	272.6	230.8	272.3	305.4	220.3	350.1	GE[4] (UP7555)

Notes:
1. EPA Regulatory Support Document, *Locomotive Emissions Regulation, Appendix B*, 12/17/1997, as tabulated by ARB and ENVIRON.
2. Base emission rates provided by ENVIRON as part of the BNSF analyses for the Railyard MOU (Personal communication from Chris Lindhjem to R. Ireson, 2006) based on data produced in the AAR/SwRI Exhaust Plume Study (Personal communication from Steve Fritz to C. Lindhjem, 2006).
3. SwRI final report *Emissions Measurements – Locomotives* by Steve Fritz, August 1995.
4. Manufacturers' emissions test data as tabulated by ARB.
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6. Average of manufacturer's emissions test data as tabulated by ARB and data from the AAR/SwRI Exhaust Plume Study, tabulated and calculated by ENVIRON.

APPENDIX E

SPATIAL ALLOCATIONS OF MAJOR DIESEL PM EMISSION SOURCES AT THE UP COLTON RAILYARD

This Appendix is provided as a visual aid to understand where significant sources of diesel PM are generated within the UP Colton Railyard. This visual layout indicates that about 50% of the emissions occur in the mid-eastern part and 35% occur in the western part of the Up Colton railyard.

Figure 1. The UP Colton Railyard shown with the Shaded Area accounting for about 85 Percent of Facility-Wide Diesel PM Emissions.

Note: According to the emissions inventory for the UP Colton Railyard about 35% percent of DPM emissions occur in the western section of the yard, as there is significant switcher and line haul activity in this area. About 50% of DPM emissions occur in the eastern section of the yard due to switcher activity as well as service activity.

Figure 2. Spatial Allocation of Locomotive Emissions at UP Colton Railyard.

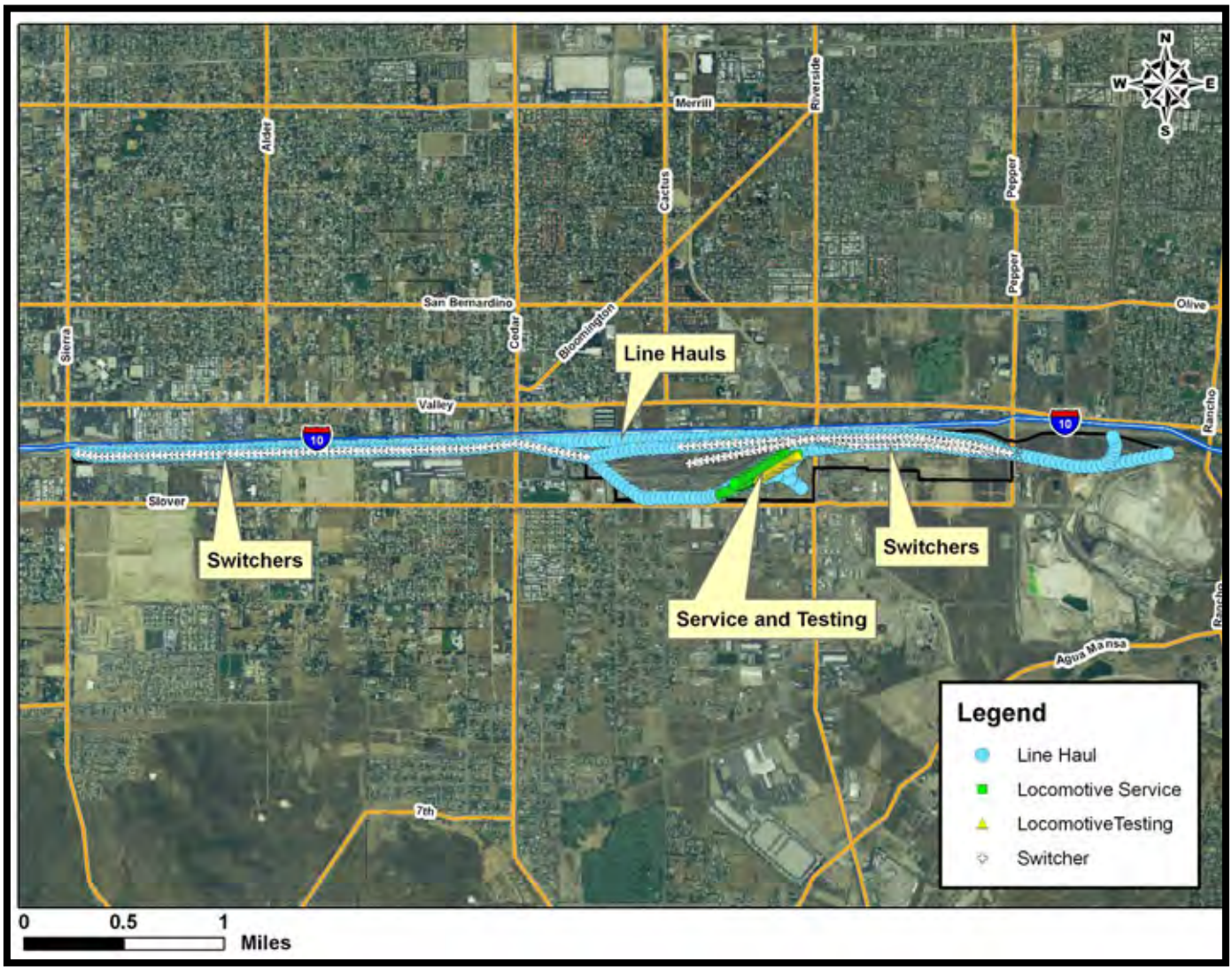


Figure 3. Spatial Allocation of Diesel PM Emissions from Line Haul Locomotives at UP Colton Railyard.

Figure 4. Spatial Allocation of Diesel PM Emissions from Switch Locomotives at UP Colton Railyard.

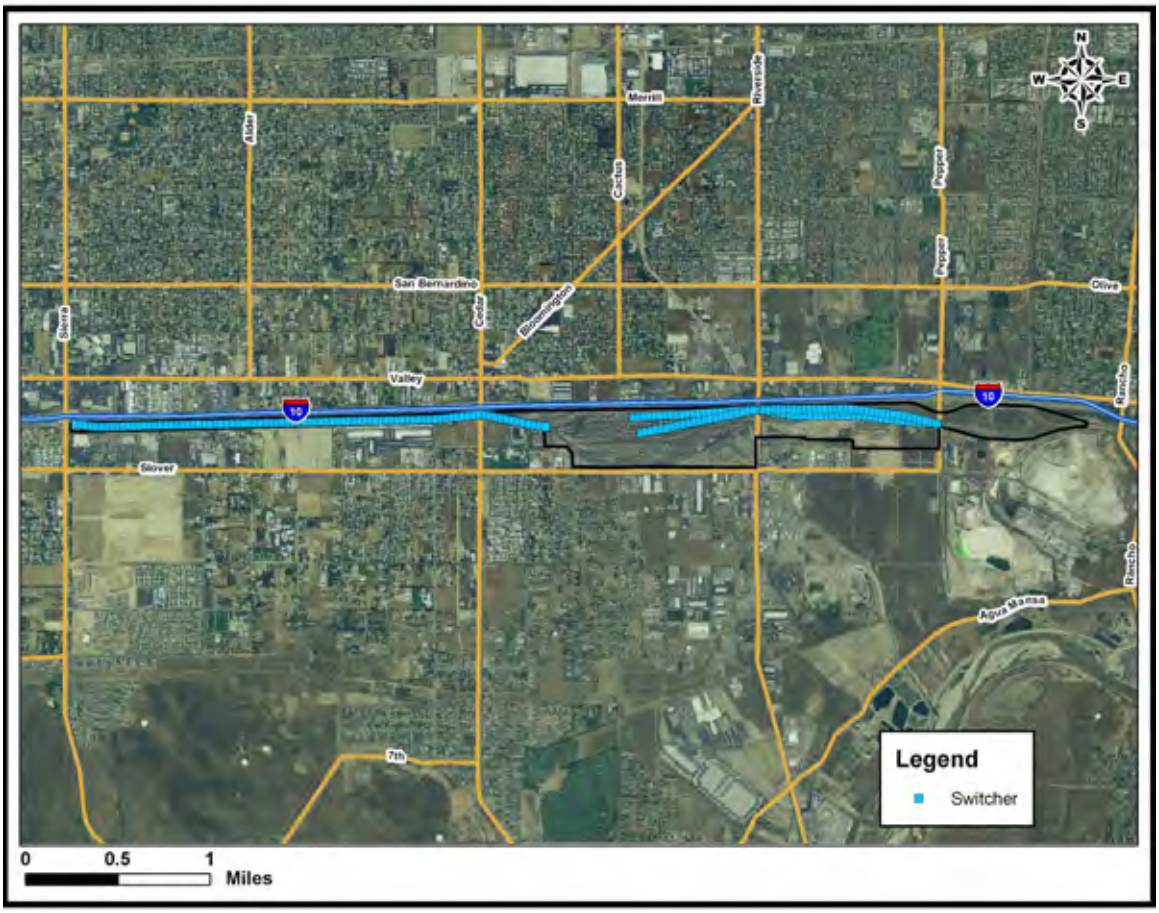


Figure 5. Spatial Allocation of Diesel PM Emissions from Locomotive Testing at UP Colton Railyard.

Figure 6. Spatial Allocation of Diesel PM Emissions from Locomotive Servicing at UP Colton Railyard.

Figure 7. Spatial Allocation of Diesel PM Emissions from Heavy Equipment at UP Colton Railyard.

Appendix F

AERMOD MODEL SENSITIVITY ANALYSIS OF METEOROLOGICAL DATA (ONE- VS. FIVE-YEAR DATA)

Figure 1. AERMOD's Simulated Diesel PM Concentrations (due to On-site and Off-site Diesel PM Emissions) around UP Stockton Railyard Using One-year Meteorological Data.

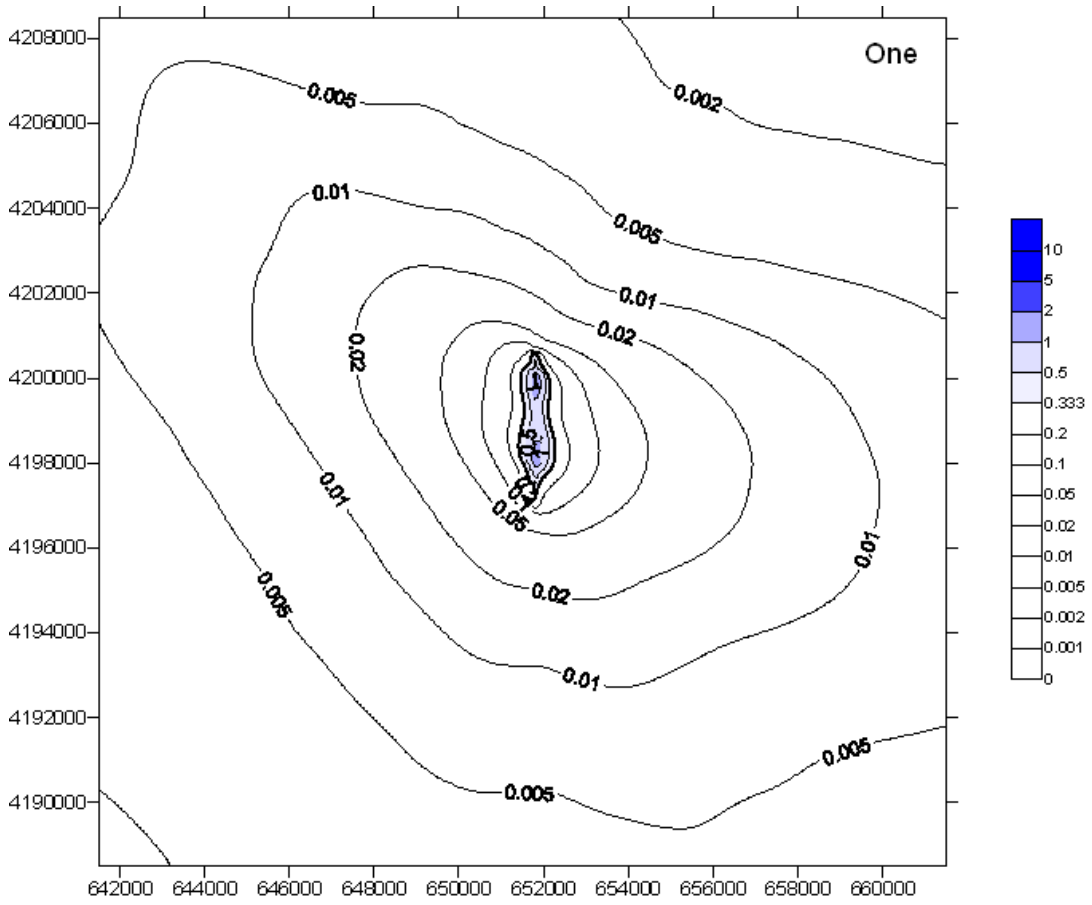
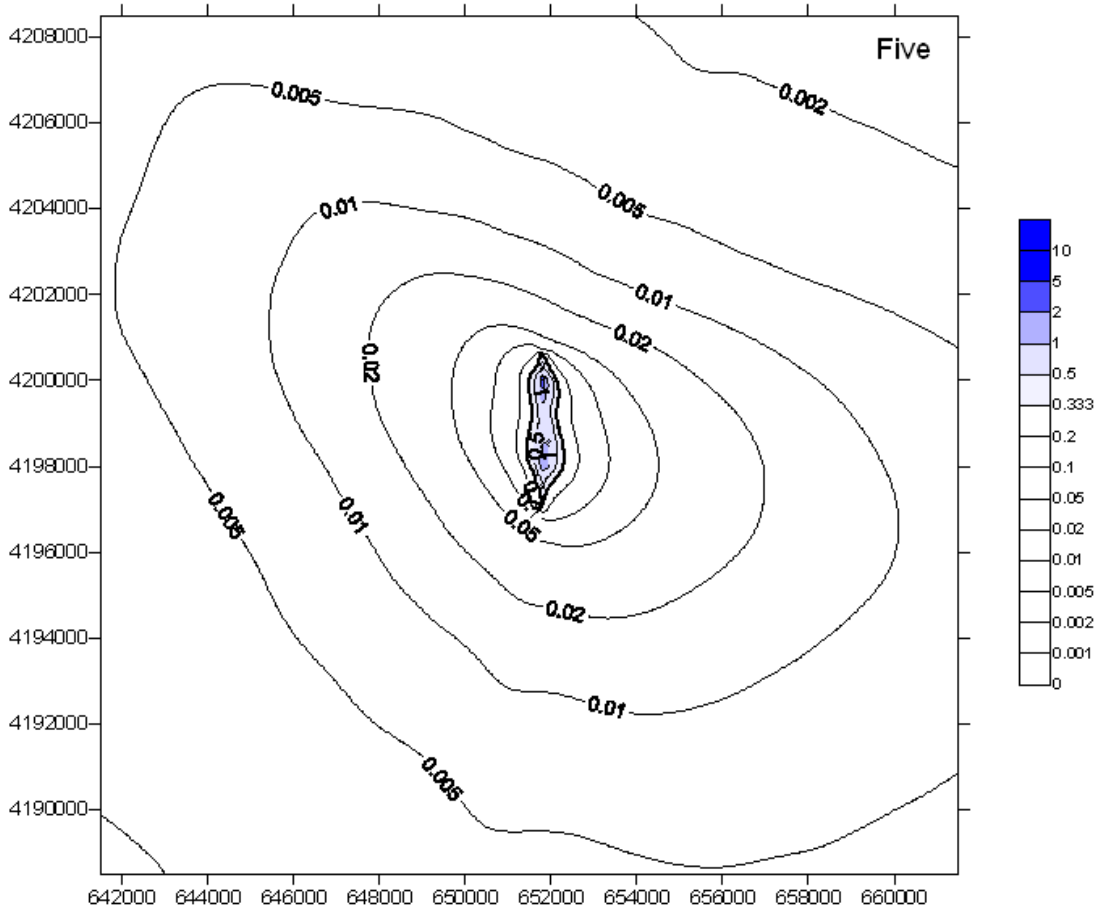


Figure 2. AERMOD's Simulated Diesel PM Concentrations (due to On-site and Off-site Diesel PM Emissions) around UP Stockton Railyard Using Five-year Meteorological Data.



A Guide for Health Impact Assessment

October, 2010

Mark B Horton, MD, MSPH, Director
California Department of Public Health

Health impact assessment may be defined as a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, program or project on the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects.

-Adapted by the International Association of Impact Assessment from World Health Organization

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San Francisco Department of Public Health

Prepared for the California Department of Public Health.

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The Values of Health Impact Assessment

From the International Association of Impact Assessment (Quigley, 2006)

Democracy – emphasizing the right of people to participate in the formulation and decisions of proposals that affect their life, both directly and through elected decision makers. In adhering to this value, the HIA method should involve and engage the public, and inform and influence decision makers. A distinction should be made between those who take risks voluntarily and those who are exposed to risks involuntarily (World Health Organization, 2001).

Equity – emphasizing the desire to reduce inequity that results from avoidable differences in the health determinants and/or health status within and between different population groups. In adhering to this value, HIA should consider the distribution of health impacts across the population, paying specific attention to vulnerable groups and recommend ways to improve the proposed development for affected groups.

Sustainable development – emphasizing that development meets the needs of the present generation without compromising the ability of future generations to meet their own needs. In adhering to this value, the HIA method should judge short- and long-term impacts of a proposal and provide those judgments within a time frame to inform decision makers. Good health is the basis of resilience in the human communities that support development.

Ethical use of evidence – emphasizing that transparent and rigorous processes are used to synthesize and interpret the evidence, that the best available evidence from different disciplines and methodologies is utilized, that all evidence is valued, and that recommendations are developed impartially. In adhering to this value, the HIA method should use evidence to judge impacts and inform recommendations; it should not set out to support or refute any proposal, and it should be rigorous and transparent.

Comprehensive approach to health – emphasizing that physical, mental, and social well-being is determined by a broad range of factors from all sectors of society (known as the wider determinants of health). In adhering to this value, the HIA method should be guided by the wider determinants of health.

PREFACE

Health Impact Assessment (HIA) has a simple and common sense purpose—to make visible the potentially significant human health consequences of public decisions and thus to facilitate the greater consideration of health in policy decisions. HIA allows decision-makers to: identify plausible, potential harms or benefits to health; enumerate the health benefits or adverse consequences of various policy options; analyze disproportionate or unequal harms or benefits to different populations; and modify policy design in more protective, beneficial, or equitable ways. HIA can provide a structure for discussion of issues where health concerns are a source of public controversy and can help generate buy-in for policy implementation.

HIA is a process that employs many types of evidence or expertise; each HIA includes a procedural step for determining the breadth of issues that will be analyzed in the process and the methods that will be employed. HIA is applicable to any policy sector (e.g., natural resources development, land use, labor). Internationally, several governments provide substantial technical and financial support for HIA and HIA is more routinely incorporated into public policy processes (WHO HIA). In California and the United States, the use of HIA is rapidly increasing, though without specific institutional mandates or extensive resources or guidance for practitioners. This Guide aims to fill a need in this emerging field by outlining key steps, activities, and issues in the HIA process.

The Guide complements Practice Standards for Health Impact Assessment published on April 7, 2009 by the North American HIA Practice Standards Working Group (www.hiacollaborative.org).Those standards are the collective product of HIA practitioners working in the North American context to translate the values underlying HIA, provide a set of benchmarks to guide HIA practice, and stimulate discussion about HIA content and quality.

The intent of the Guide is to support current and prospective practitioners of impact assessment in California and the United States, to foster thoughtful and high-quality use of HIA, and to promote consideration of health in all policies. The Guide provides a brief background on HIA, an outline of essential and common tasks in the HIA process, discussion of common issues and challenges encountered in the HIA process, examples of and links to resources for practice. It also provides suggestions for integrating health analysis within the regulatory environmental impact assessment process, obtaining inclusion from diverse stakeholders, and evaluating the HIA process. The Guide may be useful for public health or regulatory agencies responsible for implementing HIAs.

This Guide is not proscriptive, definitive, or exhaustive, nor is it a methodological toolkit for all HIA analysis. The guide does not address how to develop the capacity to conduct or institutionalize HIA (e.g., technical skills), how to construct a project team, budgeting, etc. The resources section of the guide provides links to other articles, guidance documents, and references that provide complementary information.

I. INTRODUCTION AND BACKGROUND

Living in a healthy place means having adequate housing; a secure and meaningful livelihood; access to schools, parks, and public spaces; safety and freedom from violence; unpolluted air, soil, and water; and a society that promotes not only opportunity and innovation but also cooperation, trust, and equity.

What is Health Impact Assessment (HIA)?

HIA is a systematic, structured practice that uses the best available theory and evidence to make reasoned judgments on the prospective health impacts of policy decisions, including projects, plans, programs, and policies undertaken by government or the private sector. Other defining characteristics of HIA include a broad definition of health and health determinants, application to policy making in all sectors, involvement and engagement with decision makers and affected stakeholders, explicit concern with vulnerable populations, and a commitment to inclusion and transparency (Quigley 2006). The two primary outputs of HIA are an analysis of health impacts and decision alternative and mitigation strategies to ensure that decisions protect and promote health.

Why conduct health impact assessment?

Living in a healthy place means having adequate housing; a secure and meaningful livelihood; access to schools, parks, and public spaces; safety and freedom from violence; unpolluted air, soil, and water; and a society that promotes not only opportunity and innovation but also cooperation, trust, and equity. While it is scientifically established that our health depends on such qualities and resources, the health impact of changes to these resources are often not explicitly considered by decision makers in most policy sectors (Marmot and Wilkinson 1999). In fact, the most important determinants of health and disease are subjects of policy making in institutional sectors outside the authority of the public health sector.

In 1986, the World Health Organization (WHO) urged policy makers in all sectors to “be aware of the health consequences of their decisions and to accept their responsibilities for health.” (WHO 1986) Furthermore, WHO called on policy makers to conduct HIAs of their actions with significant effects on social, economic, and environmental conditions? The fundamental premise behind HIA is that decision-making processes informed by analysis of health impacts will lead to more health-promoting policy actions. HIA aims to support healthy public decision making in the following specific ways:

- **Identifying harms and benefits before decisions are made:** Sound public policy requires information on potential health impacts, including information on both short- and long-term effects and impacts on socially excluded or vulnerable populations.

HIA findings and recommendations can inform and motivate beneficial and health-protective changes to the design of a project or policy.

- **Identifying strategies for decisions to protect and promote health:** HIA offers strategies to address potentially significant adverse health impacts or to extend potential health benefits of a policy decision. Strategies can take the form of new decision alternatives, modifications to the proposed policy, program, or project; or targeted mitigation and monitoring measures.

- **Supporting inclusive and democratic decision-making:** Democracy and the ethical use of evidence are key values underlying HIA practice (Quigley 2006). HIA is not intended to endorse or oppose a policy or project - rather it is a way to provide information for the public and decision makers to help them understand the health impacts of a proposed decision and decision options and alternatives. Public health concerns can also be prominent sources of controversy in public decisions and HIA provides a way to respond to those concerns. Because protecting health is a widely shared value, HIA may identify areas of cooperation among opposing interests and common strategies that apply to diverse interest groups. Furthermore, a transparent accounting of impacts along with mitigations may support buy-in for decision implementation.

- **Protecting Social Equity and Justice** Environmental justice is defined as the "…fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Clinton 1994). HIA provides a method to assess and address the health concerns of vulnerable populations with substantive analysis and alternatives and can promote social and environmental justice and reduce health inequities.

Steps in the HIA Process

1. ***Screening*** involves determining whether an HIA is valuable and feasible.
2. ***Scoping*** involves determining health issues for analysis, the temporal and spatial boundaries for analysis, and research methods.
3. ***Assessment*** involves using data, expertise and qualitative and quantitative research methods to judge the magnitude and likelihood of potential health impacts, their significance, and identifying appropriate mitigations and design alternatives.
4. ***Reporting*** involves synthesizing the assessment findings and communicating the results. This can take many forms including written reports, fact sheets, comment letters, and public meetings.
5. ***Monitoring*** involves tracking the decision and implementation effect on health determinants and health status.

- **Planning health and public health service delivery** Because HIA can anticipate changes in future conditions important to health, it may be valuable in planning health and public health service delivery and interventions.

- **Catalyzing social and institutional learning** A successful HIA identifies impacts, helps to fill knowledge gaps in decision making, and influences design for a particular policy, project, or plan. It also can serve as a tool for public and institutional learning. For example, HIA may lead to health-promoting design recommendations or mitigations being incorporated proactively into subsequent plans and projects at the design and planning stage.

What are the steps and activities in the HIA process?

HIA is an emerging practice in the United States and applications to date have been diverse in terms of approach, methods, and public engagement (Dannenberg 2008). As the purpose of HIA is to inform and support decision making, an HIA is optimally carried out prospectively before a decision is made. HIA can be useful at any stage of policy or project design; however, the earlier in the decision-making process that an HIA can be carried out, the greater the likelihood that HIA may provide timely information to decision makers to help understand the consequences of various alternatives.

The typical procedural steps in HIA are similar to those for other forms of impact assessment (e.g. environmental, social, and strategic) and include screening, scoping, assessment, reporting, and monitoring. These steps along with related tasks, methods, and resources are the subject of subsequent sections of this guide.

1. **Screening** involves determining whether HIA is valuable and feasible in a particular decision-making context.
2. **Scoping** involves determining health issues for analysis, the temporal and spatial boundaries for analysis, and the data and research methods employed in the analysis.
3. **Assessment** involves using data, expertise, and qualitative and quantitative research methods to judge the magnitude and likelihood of potential health impacts, their significance, and identifying appropriate mitigations and design alternatives.
4. **Reporting** involves documenting and synthesizing the assessment findings and communicating the results and recommendations of the assessment.
5. **Monitoring** involves tracking the decision and implementation effect on health determinants and health status.

HIA practice may occur along a broad continuum of breadth, methods, participation, and integration into regulatory processes. Choices in the scoping step - such as those regarding the issues analyzed, spatial and temporal boundaries for impacts, methods used, and timing of the process - should reflect the specific context and the priority health needs, interests, and questions of stakeholders and decision makers. Depending on the comprehensiveness and the methods employed, an HIA may take more or less time to complete.

A Continuum of HIA Practice		
Focused on analysis of a discrete hazard, exposure, or health outcome	**Breadth** ↔	Comprehensive consideration of all potential health effects, including positive and negative effects
Conducted by a single expert or public institution	**Participation** ↔	Oversight by multiple stakeholders or community members in partnership with public institutions
Stakeholder initiated	**Regulatory Integration** ↔	Integration within existing regulatory and non-regulatory assessment processes
Based on existing data and published research	**Methods** ↔	Collection and analysis of new data using multiple quantitative and qualitative methods

What health issues does HIA consider?

HIA employs a holistic definition of health and considers a broad set of social and environmental conditions to be determinants of health status. Issues and impacts analyzed within HIA can include physical and mental health outcomes like mortality and disability, behavioral factors, and environmental, social, and economic conditions.

Health Determinants Potentially Impacted by Public Policy Decisions			
Health Behaviors	**Neighborhood Services and Public Infrastructure**	**Environmental Conditions**	**Social, Economic, and Political Factors**
Diet Physical activity Smoking Other addictions Coping	Education Public transportation Health care Parks Community centers Water and waste systems	Housing Air, soil, and water quality Community noise Disease vectors	Livelihood Inequality Social cohesion and inclusion Political participation

How can HIA fit into existing governance institutions?

Currently, no laws explicitly require the use of HIA, per se, as an approach or method in regulatory analysis. Several legal frameworks in the United States at the federal and state levels require decision makers to analyze and avoid health effects and impacts. HIA is one method that could be used to achieve existing mandates under these rules.

For example, the National Environmental Policy Act (NEPA) of 1969 requires comprehensive and integrated environmental impact assessments of decisions with major effects on the physical environment and specifically mandates analysis of significant health effects in the development of an Environmental Impact Statement (EIS) (NEPA, 1969). State laws similar to NEPA, like the California Environmental Quality Act (CEQA), have equivalent requirements. Historically, there has been limited attention to health effects in the environmental review process, and several published empirical reviews suggest that health analysis in NEPA is currently inadequate (Arquiaga, 1994; Steinemann, 2000). For more information on NEPA, see Appendix II.

HIA may serve other policies, laws, and institutions that require health analysis. For example, Executive Order 12898 on Environmental Justice instructs all federal agencies to: “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States (Clinton 1994).” Analysis of environmental justice impacts has served to protect health supporting resources in NEPA practice (Bass 1998).

Specific health analysis and HIA requirements are occasionally included in legislation. For example, California’s Global Warming Solutions Act (AB 32, 2006), asks the

California Air Resources Board (CARB) to consider the health effects of its proposed strategies and regulations to reduce or mitigate greenhouse gas emissions and state law separately mandates CARB to consider environmental justice issues in all policies and regulations. Washington State legislation (SB 6099, 2007) explicitly required an HIA to inform mitigation planning for the State Route-520 Bridge in Seattle by quantifying project effects on air pollution exposure and other hazards.

How does HIA differ from Health Risk Assessment and other Health Assessment tools?

HIA is a process that uses diverse analytic tools. Human health risk assessment (HRA) is one analytic method for estimating health impacts. Typically, HRA is used to analyze discrete relationships between a single environmental contaminant and a single health outcome. HRAs are occasionally conducted as part of environmental impact assessment under NEPA or other regulatory assessments, and can be used as one method in HIA. HRA requires substantial data including a documented weight of the evidence relationship between the exposure and the outcome, a quantifiable dose-response function, and data on changes in exposure. Currently, sufficient data to conduct HRAs exists for only a limited number of health-relevant environmental exposures and conditions.

The scope of health effects considered in an HIA is usually much broader than that analyzed by a single HRA and includes physical, social, and economic determinants. HIA is distinct from data, research or forecasting methodologies that may be used in the HIA process. For example, GIS tools and primary or secondary environmental measures (e.g., noise, air pollutants, housing conditions) can be used to profile baseline conditions in HIA. Epidemiology studies can elucidate causes of disease and exposure-response relationships. Environmental modeling allows prediction of hazardous exposures both spatially and temporally. Methods of economic valuation, similar to those used in cost-effectiveness analysis (CEA), and cost-benefit analysis (CBA), can provide a monetary perspective of impact in HIA.

What are some of the key lessons from HIA practice experience in the United States?

There has been limited formal evaluation of the HIA experience in the United States thus far (Wismar 2004). However, experience demonstrates that the practice has had important and productive outcomes (Corburn 2007). In some cases, transparent analysis of health impacts has shaped policy design through the inclusion of health promoting choices, alternatives, and mitigations. In other cases, HIA has catalyzed inter-disciplinary practices to begin to integrate health considerations in policy design. Where practiced, HIA appears to be affecting the knowledge of diverse public and private sector actors informing policy agendas, collaborations, and coalitions.

Key tips, based on experience of the author as well as published HIA evaluations, for effective HIA include following a systematic approach, being inclusive and transparent with process decisions, and responsibly and ethically using evidence. The North American HIA Practice standards, developed as a consensus among practitioners, provide an additional guide for quality practice with explicit objectives for each stage of the process.

- **Use all the steps of the HIA process** The steps of screening, scoping, assessment, reporting, and monitoring provide a tested approach for HIA. Screening considers factors that are predictive of the value and effectiveness of HIA. The systematic process will ensure comprehensive issue identification, prioritization of assessment resources, rigorous and robust analysis, and effective translation of findings and is flexible enough to be adapted to the needs of context.

- **Use a team approach involving decision stakeholders**
  A comprehensive assessment of health impacts requires a team approach with diverse skills and capacities. Public health expertise is essential but should be complemented with expertise in planning, environmental management, policy analysis, communication, and community engagement. Stakeholder involvement in HIA helps to accurately identify important health concerns and questions about a decision and provides insights about data and strategies for analysis.

General Plan Update, Humboldt County, 2008

As part of a General Plan update, the Board of Supervisors of Humboldt County asked the public health agency to consider the health impacts of three future growth alternatives ranging from restricting development to existing urban areas to allowing continued sprawl. The public health officer consulted with a non-profit organization to conduct an HIA on the three alternatives, with participation from the planning agency and a community group (Human Impact Partners, 2008). The analysis, based upon 35 community- prioritized indicators, found that the compact development alternative would improve health outcomes related to almost all the indicators, while the sprawl alternative would harm health. The HIA process led to a strong partnership between the planning and health agencies and an increase in participation in the General Plan process on the part of community members. The planning agency used the HIA extensively in forming the policies in the Circulation element and to support infill policies in the Housing Element.

- **Use the best available evidence and acknowledge limitations and uncertainty**

Judgments in HIA should be based on the best available evidence and should acknowledge evidence gaps and uncertainty. Certainty is not a reasonable or expected standard for HIA judgments. Practitioners should be aware of their own biases as well as those of stakeholders and decision makers.

- **Use regulatory requirements for health effects analysis as a vehicle for HIA findings when appropriate.** Existing law, including NEPA and CEQA, requires public health analysis of many decisions that may have adverse environmental impacts.
- **Provide a transparent account of the HIA process** Policy decisions may be contested politically and stakeholders may have firm positions about the value or costs of a particular course of action. The HIA should explain how scoping decisions were made and document its methods and findings.

II. SCREENING

Objective:

- **Determine whether to conduct an HIA.**

Because it is not possible or desirable to conduct an HIA on every project or policy decision, deciding whether to conduct an HIA (versus some other strategy to address health issues) should be the first step in the process (Taylor 2003). If health effects analysis is required by law, screening can consider whether HIA is the most useful method to achieve this mandate. Evaluating whether to conduct an HIA involves answering the following screening questions:

- **Value of HIA**
  - Are there potentially significant health effects associated with decision alternatives?
  - Could these impacts create or exacerbate health inequities?
  - Are the impacts already well understood or are they hidden, uncertain or controversial?
  - Are there potential approaches to mitigate health effects or leverage the decision to promote health not yet included in policy proposals?
- **Feasibility and capacity to do HIA**
  - Do available data and evidence support an HIA?
  - Are there resources and technical capacity to conduct analyses?
  - Is there leadership and commitment to communicate findings and recommendations within the decision-making process?
- **Receptiveness of the decision-making process**
  - Is the decision-making process open?
  - Do policy or legal requirements mandate addressing or mitigating health impacts?

Projects that may benefit most from HIA are those in which potential health impacts are significant or may disproportionately effect a vulnerable population: timely, meaningful analysis and effective communication is possible; and the decision-making process is receptive to the information. An HIA may not be warranted if existing regulations protect against a project's likely health impacts or a comprehensive and community responsive health analysis is already integrated with EIA.

An HIA may be particularly valuable if impacts are uncertain or there is controversy about the policy, plan, or project. An HIA may also be useful if health impacts are

scientifically established but not widely acknowledged or understood by decision makers and stakeholders or to evaluate strategies to mitigate known health impacts.

The feasibility of an HIA depends upon being able to conduct an informative HIA within the decision-making timeframe with available knowledge, methods, personnel, and other resources. Constraints on feasibility (e.g., limitations on data or time) may require limiting the scope of issues or methods of analysis.

The impact of an HIA depends, in large part, on the openness of decision makers to receiving and acting on the information. Openness is typically greater at earlier stages of policy or project development. If a decision-making process appears rigid, a HIA and effective communication may serve to open up the process to new issues and alternatives.

Effective screening requires having sufficient information about the decision needed, the decision makers, and stakeholders. Ideally, screening should involve decision makers and stakeholders to ensure constructive dialogue and acceptance of findings. Entities choosing to conduct an HIA should notify all stakeholders, responsible public officials, and the decision makers of these plans.

For some categories of decisions or projects, checklists may support issue or impact identification in the screening or scoping process. Below is an example of a checklist that can be used to scope the potential health impacts of land use and economic development decisions in a U.S. context. The list is not exhaustive or prioritized but illustrates the breadth of health determinants that may be considered in the scope of HIA. A similar checklist could be created or adapted from the example below for other project types or to reflect context specific concerns.

Example of a HIA Screening Checklist		
Essential Screening Questions	**Yes/No/ Unknown**	**Supporting Facts/ Rationale**
Value of and need for HIA ➢ Does the decision have the potential to effect, directly or indirectly (positively or negatively), health outcomes via environmental or social determinants of health? ➢ Could these impacts create or exacerbate health or social disparities? ➢ Are the proposal's impacts to health potentially significant in terms of the number of people impacted and/or the magnitude, breadth, and immediacy of impacts? ➢ Are the health impacts unknown, uncertain, or controversial? ➢ Could HIA recommendations potentially improve the impact that the plan, policy, or program has on health?		
Feasibility of conducting HIA ➢ Are leadership, resources, and technical capacity available to conduct analyses? ➢ Do data and research methods exist to analyze health impacts of concern associated with this decision? ➢ Which stakeholders have the interest and capacity to participate in an HIA (scoping, research, communication)?		
Receptiveness of the decision-making process ➢ Is there a pending decision regarding the project, plan, or policy? ➢ Has a final decision about the proposal been made? ➢ Are there policy/legal requirements mandating the consideration of direct and/or indirect health impacts? ➢ Is there sufficient time and is it feasible to analyze the project before a decision is made? ➢ Are stakeholders requesting an HIA to inform the decision-making process? ➢ Is the decision-making process open to HIA and/or recommendations for changes to design, mitigations, and alternatives?		

Health Determinants Potentially Impacted by Plans, Projects, and Policies	
Potential Effects on Health Determinants	**Relationship between Health Determinants and Health Outcomes**
Employment and Livelihood Will the decision affect: . Level and security of employment? Proportion of the population living in relative or absolute poverty? Hazardous employment conditions? Employment quality or job benefits? Industrial diversity and resilience?	Unemployment results in material poverty, chronic stress, and low self-esteem. There is a dose-response relationship between income and life expectancy across the income distribution. Health care and sick leave benefits support the use of preventative care. Job autonomy predicts reduced mortality from cardiovascular disease.
Housing Will the decision affect: Housing affordability? Adequacy of housing supply? Quality or safety of housing? Residential segregation?	Crowded conditions can increase the hazard for infections, respiratory disease, fires, and poor mental health. Unaffordable rents or mortgages result in trade-offs between material needs such as housing, food, and medical care.
Food Security and Nutrition Will the decision affect: Supply or cost of food? Food safety? Access to food resources? Nutritional behaviors?	Adequate nutrition is necessary for normal development and growth, normal body homeostasis, immunity, and preventing obesity and diet-related diseases.
Environmental Quality Will the decision affect: Level of hazardous chemical or biological pollutants in outdoor air, soil, or drinking water[1]? Level of hazardous chemical or biological pollutants in indoor air? Level of environmental noise?	Air pollutant exposure retards lung growth, exacerbates respiratory disease, and increases cardio-pulmonary mortality. Indoor aero-allergens cause or exacerbate asthma. Water is a vehicle for communicable diseases. Chronic noise exposure harms sleep, temperament, hearing, and blood pressure. Solar and ionizing radiation are known carcinogens.

[1] Compliance with regulatory standards does not necessarily equate with health protection for all exposures or sub-populations.

☐ Exposure to non-ionizing or ionizing radiation?	
Safety Will the decision affect: ☐ Demographic composition or social cohesion in an area? ☐ Risk and response to fire hazards? ☐ Hazard or frequency of transportation accidents or unintentional injuries?	Social cohesion inhibits crime and violence, which can result in injury or property loss and provoke fear or stress. Projects can stress capacity of public safety institutions, limiting their response capacity to emergencies. Projects may increase motor vehicle traffic and collisions.
Transportation Will the decision affect: ☐ Access to jobs, goods, services, and educational resources? ☐ Number of trips walking and bicycling? ☐ Vehicle miles traveled? ☐ Vehicle volumes or speeds? ☐ Availability and convenience of public transit services?	Access to employment, education, parks, and health care are critical for meeting health needs. Public transit provides such access for those without automobiles. Pedestrian and bicycle facilities facilitate active transport, reducing heart disease, diabetes, obesity, blood pressure, osteoporosis, symptoms of depression, anxiety, and falls in the elderly. Vehicle volume is proportional to collision rates and vehicle speeds are proportional to injury severity.
Education Will the decision affect: ☐ Access and capacity of schools for children or adults? ☐ Quality of educational resources?	Educational success predicts both health status and life expectancy. Children commuting to school get less sleep and exercise and greater exposure to vehicle pollution. Quality community schools can promote parent participation and good educational outcomes.
Parks and Natural Space Will the decision affect: ☐ Quality, proximity, or access to parks and public spaces? ☐ Natural spaces or habitats?	Contact with nature facilitates cognitive and physical development and serves a restorative function throughout life. Park access increases physical activity and reduces the risk of developing heart disease, diabetes, osteoporosis, and obesity. Trees and greens space remove air pollution from the air and mitigate urban heat island effects.
Goods and Services Will the decision affect: ☐ Quality and proximity of financial institutions?	Timely access and use of primary health services can prevent serious hospitalizations. Quality child care increases childhood educational and job outcomes. Local financial institutions help families create and maintain

☐ Quality and proximity of child care services? ☐ Quality and proximity of health services?	wealth.
Social Cohesion Will the decision affect: ☐ Quality or frequency of contacts with friends, family members, and neighbors? ☐ Attitudes towards or stereotypes of racial, social, and ethnic groups? ☐ Participation in voluntary organizations and activities?	Physical and emotional support buffers stressful situations, supports illness recovery, prevents isolation, contributes to self-esteem, and reduces the risk of early death.
Social Equity and Inclusion Will the decision affect: ☐ Segregation by race, ethnicity, or income? ☐ Degree of inequality in income or wealth? ☐ Degree or quality of participation in public decision making?	Social contact across ethnic and income groups ensures equitable access to public health and educational services. Residents of low-income and ethnically segregated neighborhoods experience high rates of teenage childbearing, tuberculosis, cardiovascular disease, and homicide. Income inequality in a region or country predicts population life expectancy independent of income in wealthy countries. Participation and power in the political process affects government responsiveness to health needs and crises.

III. SCOPING

Objective:

- **Create a plan and timeline for conducting an HIA that identifies priority issues, research questions and methods, and participants' roles.**

Scoping defines the research objectives, methods, and boundaries of the HIA process. Setting the scope of the HIA means determining:

- Who will conduct the analysis and under what oversight?
- Which specific decision alternatives will be evaluated?
- Which potential health impacts will be analyzed?
- What are the geographic and temporal boundaries for impact analysis?
- Will disparate effects on any subpopulations be considered?
- What data, methods, and tools will be employed to evaluate impacts?
- Which experts and key informants will be engaged?
- What is the plan for stakeholder engagement and public review of the HIA?
- What is the timeframe for the assessment?

Some of these scoping questions will be discussed initially in the screening stage of the HIA. The scoping stage goes beyond these initial considerations in screening to make decisions about the research and work that the HIA will entail.

While HIA should focus on health impacts of greatest potential significance, an HIA team should not be overly selective in scoping. For example, a HIA initiated by one individual, public agency, academic discipline, business entity, or community group may choose issues or methods for impact analysis that are aligned with their interests, expertise, or values. Similarly, recommendations may reflect only stakeholder or agency interests rather than the range of best available alternatives. Unwittingly, decision makers may accept a limited or incomplete HIA as a full and objective accounting of all health issues.

Leadership for HIA may come from diverse arenas in the public or private sector. An individual, organization, or agency undertaking an HIA must have the necessary capacity and resources to do so, including some expertise in the likely public health impacts of the project; the ability to collect or access data or knowledge about the health conditions, economy, social environment, and cultural characteristics of the affected communities; the ability to coordinate participation among stakeholders and public and private organizations; and the ability to communicate findings to decision makers. Regardless of which entity conducts or coordinates the HIA, assessment of a comprehensive scope of impacts benefits from having a team of contributors with a diverse set of skills related to assessment and reporting.

Broad participation in scoping ensures the most important issues and best evidence are included in the analysis. Stakeholder and community participation provide knowledge and access to data sources and analytic tools that may be used in the assessment phase of the HIA. Community members knowledgeable about conditions in a place and the particulars of a proposed action also support comprehensive issue identification. Local medical providers bring first-hand knowledge about the health problems of people living in a particular place. Local, state, and federal public health agencies conduct disease surveillance and maintain health data systems (e.g., vital statistics, communicable disease reports) on the baseline health status of affected populations, have expertise to identify and understand potential health impacts, and help establish local public health priorities.

Participation in the scoping phase should also include expertise from diverse sectors and subject disciplines. Scoping of HIAs often requires considering and evaluating complex causal pathways among policy or project decisions and health outcomes. Accordingly, the realm of possible pathways that connect decisions to health impacts involves diverse environmental conditions and human biological mechanisms and HIA needs to employ corresponding expertise. For example, analyzing environmental impacts of neighborhood conditions on respiratory disease could require understanding housing quality and adequacy, patterns of social interaction, air pollution emissions sources and exposure pathways, endemic respiratory diseases, and respiratory physiology. HIA aims to provide a comprehensive accounting of the most important health impacts and the dominance of one sector or discipline can both bias the choice of impact analysis questions and limit the capacity to conduct needed analysis. For example, if participants in scoping only have expertise in one subject area (e.g., air or water pollution), then these issues are likely to get priority consideration in the scoping and analysis process, perhaps to the detriment of assessing other issues of similar significance.

Stakeholders can have more formal roles in the oversight of HIA. For example, in conducting a HIA on expansion plans for the Port of Oakland, the University of California, Berkeley Health Impact Group established a collaboration agreement with West Oakland neighborhood residents and stakeholders. Under this agreement, community stakeholders reviewed and approved the scope of the HIA and took responsibility for communicating results while the university was responsible for research (West Oakland HIA Working Group, 2007). Stakeholder oversight that is representative of diverse interests can add a significant measure of legitimacy and authority to the HIA process and its findings.

Resources and capacity to conduct an HIA should be considered in the course of scoping. While there may be many important health impacts and needs for analytic approaches, the scope of an HIA may depend on available data and methods and technical capacity to conduct the assessment. HIA methods that require the least resources include literature review, secondary data analysis, document review, and focus groups. Typically, in urban areas, there exists substantial data on demographic, economic, and environmental conditions. Original data collection, whether through surveys, exposure analysis, or health risk assessment, can require significant expertise and capacity.

All the agreements regarding the scoping questions should be documented as a part of the HIA process. This includes deciding who defines priority questions, who conducts the assessment, who reviews the findings, who prioritizes the recommendations, and who owns and communicates the results.

The example below outlines the scope of a HIA for a hypothetical decision to widen a limited-access highway that runs through residential neighborhoods. (The identified health impacts and analytic methods in the example should not be considered exhaustive.)

Hypothetical HIA Scope of a Highway Expansion Project	
Decision: Whether to Widen a Ten-Mile Stretch of Highway by Adding a Lane	
Scoping Question	**Response**
Roles?	• Local health department: Coordination, research, and report writing • University: Research and impact analysis • Project Sponsor: Research and report review • Community oversight board: Report review, recommendation development, and stakeholder communications
Design alternatives?	• Adding a lane in each direction to an existing highway • Ongoing maintenance of existing highway • Redirection of construction and operation funds to municipal bus agency
Geographic and temporal limits?	• Impacts on residential communities living within 1000 feet of the highway (on both sides) along the ten-mile stretch • Current and future impacts over a ten-year period
Hypothesized impacts?	• Residential and business demolition and displacement along the corridor • Increased vehicle air and noise emissions • Pedestrian hazards in adjacent residential neighborhoods from increased traffic • Increased stress, impairment of sleep and cognitive function, and hypertension from noise • Respiratory and heart disease morbidity and mortality from air pollutant exposure • Change of employment or school, loss of social networks, and loss of community services from displacement • Property devaluation and migration of due to increased hazards and reductions of neighborhood livability
Potentially vulnerable populations?	• Families living in housing adjacent to highway • Low-income seniors from a senior center that is close to the highway • Students and staff at a community school adjacent to highway
Data for baseline conditions assessment?	• Existing environmental quality measures (e.g., noise, air pollution) from regulatory agency monitoring and available environmental documents • Traffic volume data from local and state transportation agencies • Traffic injury data from law enforcement agency • Data on neighborhood health status from local health department? or hospital records • Complaint data records from the environmental health agencies • Map of community businesses, public services, and other neighborhood resources • Demographic data and trends from census data • Property values and trends from local tax assessment data

Impact analysis methods	• Modeled current and predicted noise levels using FHWA Traffic Noise Model • Predicted impacts of noise levels on community annoyance, sleep disturbance, school outcomes, and hypertension • Modeled current and predicted air pollutant concentrations of particulate matter and nitrogen oxides using physical dispersion models • Predicted impacts on pollutant levels on premature mortality and asthma exacerbations • Conducted qualitative analysis of traffic volume effects on pedestrian hazards and barriers to access • Conducted demographic analysis of impact burdens • Conducted economic analysis of property tax values
Potential mitigations?	• Measures to reduce noise emissions (e.g., road surface treatments or speed reductions) and to mitigate exposure (e.g., sound walls or residential window retrofits) • Measures to reduce air pollution exposures inside residences (e.g., ventilation system retrofits) • Engineering measures to re-route or calm traffic in residential areas • Mitigation fund to relocate displaced residents or businesses within community
Experts and key informants?	• Traffic engineers, noise and air quality modelers, environmental epidemiologists, school and senior center officials, local city legislator, neighborhood center director
HIA Timeframe?	• Assessment to be completed within three to four months in order to submit to transportation board, which will decide in six months whether to proceed
Public review?	• Traffic, air quality, and noise engineers to review exposure modeling results • Community advisory body to review assessment and alternatives analysis • Public hearing to share results organized by community advisory board • Public comment period

IV. ASSESSMENT

Objectives:

- **Develop a conceptual model for impact analysis.**
- **Determine the baseline heath status, health-relevant conditions, and vulnerabilities in the population or area potentially impacted by the decision.**
- **Judge prospective health impacts using available data, qualitative and quantitative analysis, and expert and experiential knowledge.**
- **Identify strategies for policy, program, or project design, mitigations and alternatives to protect and promote health.**

Impact analysis aims to provide prospective judgments on the existence, magnitude, and direction of potential health impacts that may occur in the future contingent on alternative decision choices. These judgments may or may not include quantitative predictions or projections. Impact analyses can serve several different purposes for decision makers. They can identify previously hidden, potential scenarios in which harms or benefits might occur, allowing decision makers to modify or design policy in protective or beneficial ways. They can enumerate costs and benefits and allow for a more comprehensive analysis of trade-offs. They may offer predictions or projections of effects, allowing evaluation against an established standard or criteria for action. They can serve to gauge or plan an adaptive response or they can be responsive to public concerns or questions. The needs of the decision-making process should be explicitly considered in determining the type and form of impact analysis.

While HIA may use diverse sources of evidence (e.g., empirical research, expert opinion, local knowledge, quantitative models) to evaluate hypothesis and research questions, it does not typically generate new empirical evidence. Rather, HIA uses existing theory and evidence to make judgments and evaluate future scenarios. The evidence used in HIA must be evaluated for internal and external validity; however, as HIA judgments are generally not testable or falsifiable, their validity may be better judged in terms of plausibility and transparency (Veerman 2007; Petticrew 2007). Issues related to the sources and uses of evidence and the validity of judgments are discussed in the sections below.

Developing a Conceptual Model

Impact analysis requires a conceptual model (logic model) linking the decision at hand to human health effects. Conceptual models are a framework for plausible scenarios for changes in population health in the future contingent on a particular decision. The conceptual model usually outlines several linked causal relationships and forms the basis of questions used to evaluate health impacts.

Conceptual models for HIA may integrate theories and empirical research from diverse disciplines. For example, a simple model linking a decision to expand a motor vehicle roadway with morbidity from asthma is illustrated below.

Roadway widening → Vehicle volume → Air Emissions → Pollutant Concentration → Pollutant Exposure → Asthma Morbidity

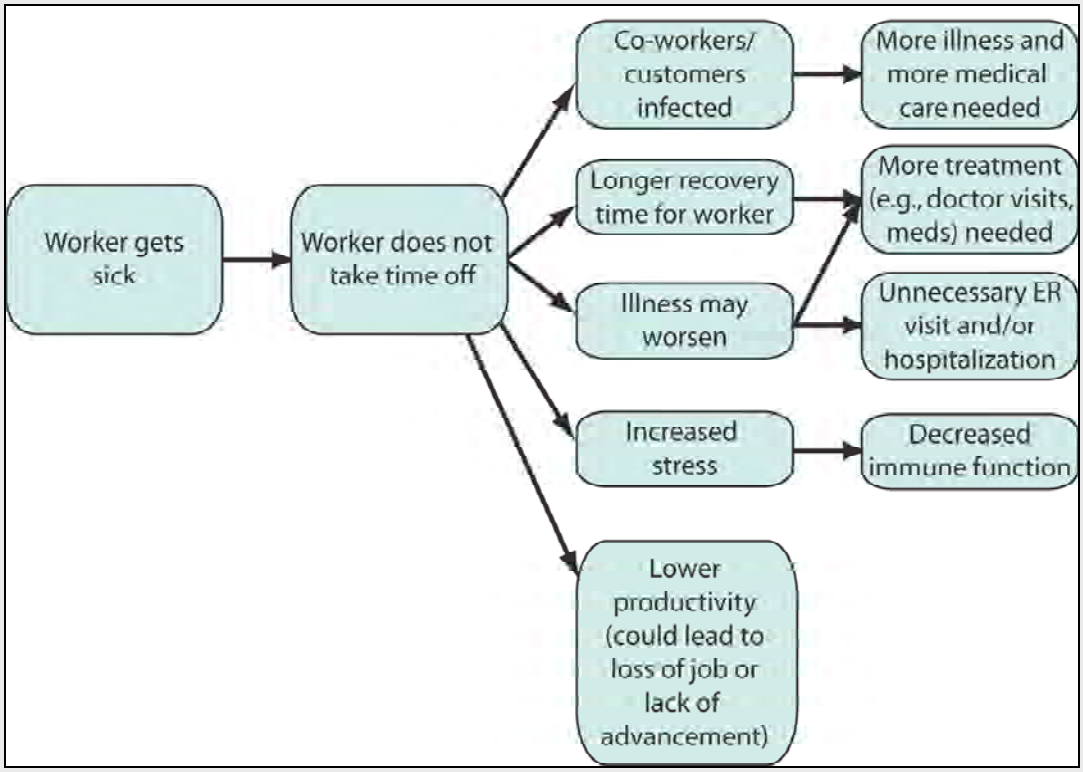
The relationship between roadways and vehicle volume is a function of transportation behavior, the relationship of vehicle volume to pollutant exposures are physical effects described by mechanistic models, and the relationship between exposure and morbidity is a biological effect established though epidemiologic research.

Conceptual models used in HIA should consider the interplay among contextual, environmental, and cultural factors; human and social behavior; and human biology. For example, the transmission of a communicable respiratory disease at the population level involves social contact among people in households, workplaces, and schools; environmental factors such as household crowding and ventilation; and social factors such as income and support networks.

The scenario described in the figure below—developed for an HIA of legislation mandating paid sick days in California—describes what might happen if a sick worker does not take unpaid time off and instead goes to work sick with a disease communicable through casual contact. Having access to paid sick days is hypothesized to influence the probability of the sick worker staying home from work. If the sick worker attends work when sick, he or she may transmit disease to co-workers or customers. If the worker defers rest or medical care, he or she may require more time to recover or suffer more severe disease requiring a greater level of health care intervention.

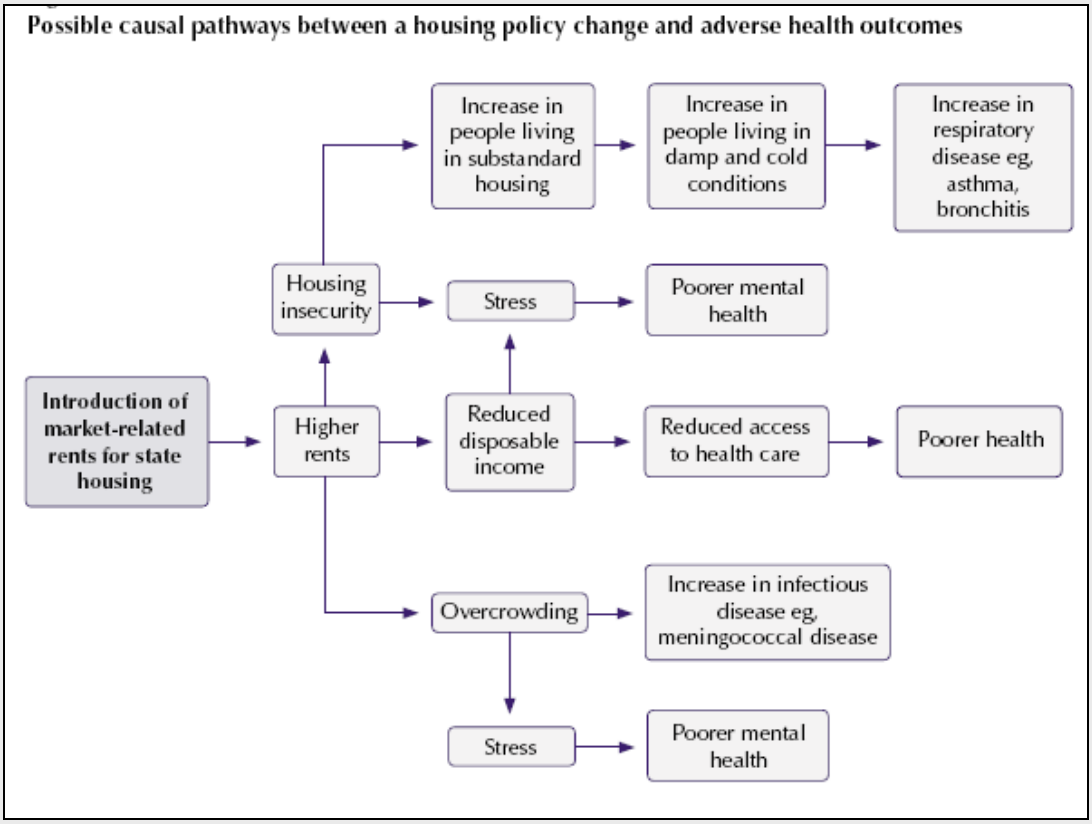
Conceptual models for HIA can describe multiple causal steps between decisions and health outcomes. Longer causal chains may introduce uncertainty with regards to the effect or its magnitude; however they do not necessarily make health effects implausible or unimportant. The scenario below describes a sequence of potential health consequences that may arise from changes in a housing rent policy for state housing. The immediate effect is increased housing rents. Secondary effects include housing insecurity, living in substandard housing, overcrowding, or an inadequate household income for essential needs. Tertiary effects are on health status and disease outcomes.

Potential Health Impacts of Worker Going to Work Ill



Source: Bhatia R, et al. A Health Impact Assessment of the California Healthy Families, Healthy Workplaces Act of 2008. Oakland, California: Human Impact Partners and San Francisco Department of Public Health. July 2008.

Potential Health Impacts of Changes in Housing Rents



Source: *Public Health Advisory Committee. A Guide to Health Impact Assessment: A Policy Tool for New Zealand. 2004*

Epidemiologic and Empirical Research

Epidemiologic and other empirical research is used in HIA in developing and evaluating the conceptual models and alternative scenarios. Empirical research provides evidence to support or refute causal links in models and to predict the magnitude and likelihood of effects.

All empirical evidence should be systematically evaluated for internal and external validity. A statistical or spatial association based on empirical observation through epidemiologic and empirical studies does not necessarily demonstrate cause and effect. In general, causal inferences should be made on the basis of the weight of the evidence. Reviews of evidence for HIA should use a priori study inclusion criteria reflecting the outcomes, exposure variables, and populations or time periods of interest and should be attentive to limited study power and biases due to selection error, loss to follow-up, analytic methods, and confounding (Mindell 2006). Criteria, such as those proposed by Sir Bradford-Hill, may help evaluate whether the weight of evidence lends support for a cause and effect relationship (Hill 1965). In considering external validity, the reviewer should consider whether it is appropriate to generalize findings from limited studies across time, place, or demographic subgroup. Evaluation of empirical research should be sensitive to documenting and addressing conflicting evidence.

Potential health impacts of the reallocation of mass transportation funds

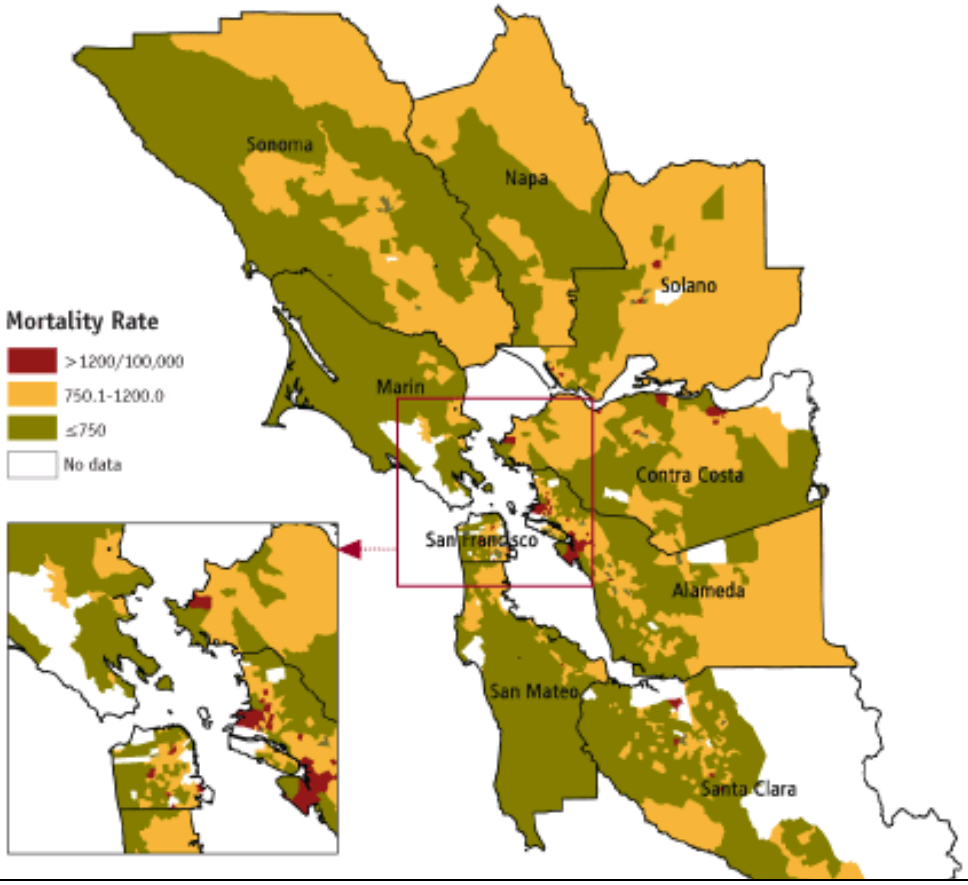
On August 21, 2007 the California State Legislature approved a budget that included the Governor of California's proposal reallocation of approximately $1.3 billion in mass transportation funding. A health impact assessment (HIA) of this proposal published in 2008 reviewed the research literature in consultation with experts in the transportation field to identify eight potentially significant pathways through which the proposed cuts to transit funding might impact public health: air, water and noise pollution; economics, land-use, physical activity, discretionary time and social capital. (UCLA, 2007)

Searchable databases, like PUBMED maintained by the National Institutes of Health, provide access to empirical literature in biomedicine and other disciplines (www.ncbi.nlm.nih.gov/pubmed). The Guide to Community Preventive Services is a collection of systematic reviews of programs and policies to improve health and prevent disease (www.thecommunityguide.org). In addition, the Cochrane Collaboration (www.cochrane.org) and the Campbell Collaboration (www.campbellcollaboration.org) provide systematic reviews, respectively, of medical and of social interventions in education, crime and justice, and social welfare. Public agencies, colleagues, online searches, and professional networks are sources for other unpublished works.

Baseline Conditions

A profile of existing conditions is necessary in HIA to depict the current health status of affected populations as well as potential sensitivities, vulnerabilities, and needs. Understanding baseline conditions is particularly important for HIA because pre-existing conditions both at the community and individual levels can mediate health impacts associated with environmental changes. For example, populations with baseline exposure to high levels of air pollutants or a high prevalence of diseases sensitive to pollution may be vulnerable to adverse health impacts from small incremental increases in air pollution.

Profiles of baseline conditions may include indicators for health status (e.g., life-expectancy) as well as indicators for known social, economic, and environmental health determinants (e.g., wages, air pollutant concentrations). Profiles of baseline conditions can illustrate variation or inequities in health status or health determinants related to place or population characteristics. Such inequities may highlight vulnerabilities related to health impacts or needs for project or policy design. For example, the map below illustrates the regional variation in mortality rates by census tract in the San Francisco Bay Area. The substantially higher localized rates in some tracts likely reflect a concentration of conditions adverse to health (e.g., poverty, social disorder) and lack of health assets (e.g., livelihood, parks, schools).



Regional Variation in Mortality Rates in the San Francisco
Source: Bay Area Bay Area Regional Health Inequities Initiative (www.barhii.org)

The selection of indicators for a baseline conditions analysis should reflect priority health issues being addressed in the HIA. Examples of potential community-level health indicators are provided in the table below.

	Examples of Health Status and Health Determinants Indicators
Health Determinants	**Examples of related social Indicators**
Livelihood	▪ Proportion of area residents employed ▪ Proportion of area residents living in relative or absolute poverty ▪ Share of jobs that meet health supporting criteria: self-sufficiency incomes, paid sick leave, health insurance, etc.
Housing	▪ Ratio of median income to median cost of housing ▪ Proportion of population living in overcrowded conditions ▪ Proportion of households without adequate heat, water, or sanitary services
Transportation	▪ Vehicle miles traveled per capita ▪ Proportion of households commuting to work by public transit ▪ Number, type, and location of traffic collisions
Retail and public services	▪ Proportion of population within ½ mile of a full-service grocery store or fresh produce market ▪ Proportion of population within a 30 minute transit or walking commute of a primary care public health facility ▪ Proportion of population within ½ mile of regional transit stop and ¼ mile of local public transit stop ▪ Proportion of residential units within ¼ and ½ mile of public elementary and middle schools
Access to parks and natural space	▪ Proportion of population within ¼ mile of neighborhood or regional park, open space, or publicly accessible shoreline ▪ Acres of neighborhood parks and natural habitats per capita ▪ Proportion of land area under tree canopy
Access to primary health services	▪ Proportion with government provided health services or health insurance ▪ Proportion of households within 1 mile of a health care center or primary care services
Environmental quality	▪ Proportion of population living a safe distance from roadways and industries emitting hazardous pollutants ▪ Capacity of drinking water supply ▪ Proportion of population living with ambient noise levels below 65 decibels ▪ Acres of cultivatable land ▪ Per capita waste generation
Social cohesion	▪ Proportion of voting age population participating in elections ▪ Perceived level of safety and “trust” of neighbors ▪ Rates of violent and property crimes ▪ Residential segregation by race/ethnicity and income

Data Sources, Data Collection, and Indicators Systems

To the extent feasible, analysis in HIA will use existing data from the diverse sources available. For example, in the United States, the Behavioral Risk Factor Surveillance System (BRFSS) provides data on indicators of certain health behaviors and risk factors, the National Center for Health Statistics (NCHS) compiles national vital statistics, and the Bureau of Labor Statistics (BLS) provides data on labor and employment conditions. Data on environmental conditions are available from regulatory

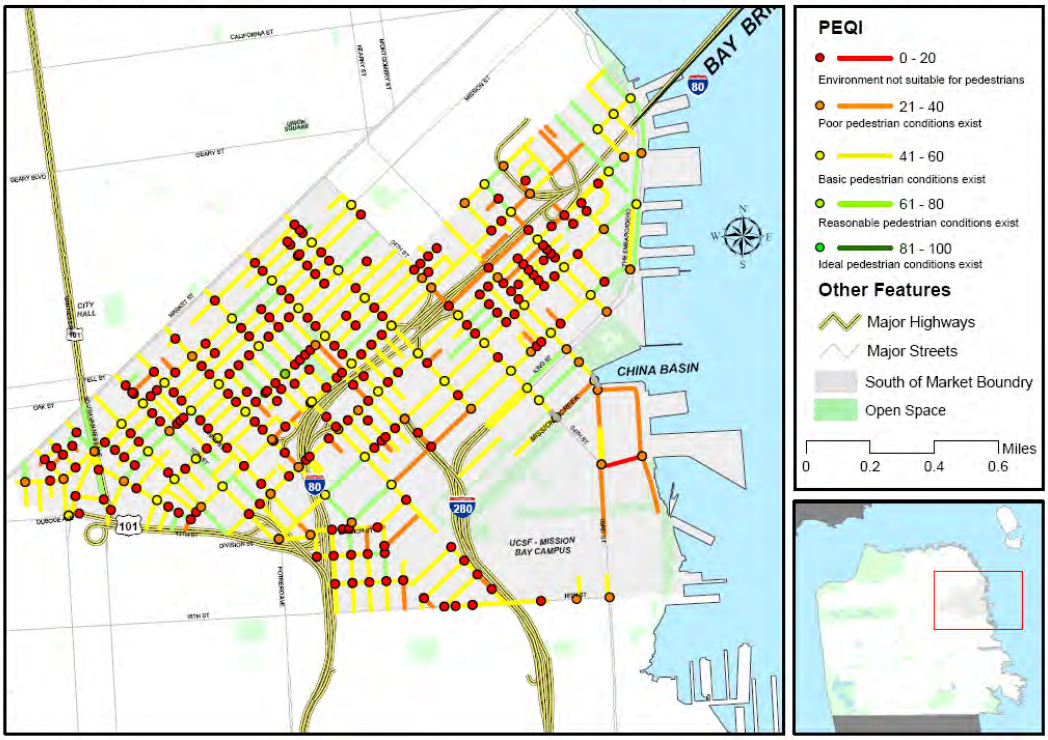
agencies and are often mapped spatially. For example, the U.S. Clean Air and Clean Water Acts created a national system to monitor select pollutants and the U.S. Environmental Protection Agency maintains national data on air and water quality. Local and state governments may track diverse data including traffic volumes, ambient levels of noise, traffic accidents, reported crime, and housing code violations. The University of California, Los Angeles (UCLA) HIA Clearinghouse (HIA-CLIC) maintains links to different data sources and methods useful for HIA (http://www.ph.ucla.edu/hs/hiaclic/).

Numerous place-based comprehensive indicator systems have been developed to monitor conditions relevant to health. Communities Count is a comprehensive health indicator system for King County, Washington (www.communitiescount.org). The Connecticut Association of Directors of Health has devised the Health Equity Index as a tool for evaluating social conditions in a community (www.cadh.org). In San Francisco, the Department of Public Health developed the Healthy Development Measurement Tool (HDMT) that includes a comprehensive set of community health indicators (www.thehdmt.org). The community indicators consortium (http://www.communityindicators.net/), Sustainable Measures (http://www.sustainablemeasures.com/), the International Sustainability Indicators Network (http://www.sustainabilityindicators.org/), Redefining Progress (http://www.rprogress.org), the CDC environmental public Health Indicators Project (http://www.cdc.gov/nceh/indicators/) are other sources of social, environmental, and economic indicators.

Desired data may not always be available to inform decision making or may not be available at the needed geographic scale. When unmet data needs exist, HIA may involve original data collection or development of new indictors to illustrate health-relevant conditions For example, to support HIA for development projects, San Francisco developed a Pedestrian Environmental Quality Index (PEQI) that requires collecting data on factors such as street crossing distance, signal timing, cross walk treatments, lateral separation, traffic speeds, traffic volumes, driveway conflicts, turn conflicts, lighting, and shade trees (www.sfphes.org). Each variable is weighted and scaled so that the PEQI represents a cumulative score (maximum 100) for an intersection or segment. Gathering and presenting the data in this way can help evaluate existing conditions and hazards and prioritize infrastructure improvement needs of walkers.

The figure below illustrates a PEQI map for several mixed residential-commercial neighborhoods in San Francisco. While basic pedestrian infrastructure exists (e.g., sidewalks and marked crosswalks), the environment is not particularly desirable for walkers, due to wide, multi-lane streets and heavy traffic volumes.

Pedestrian Environmental Quality Index in South of Market, San Francisco



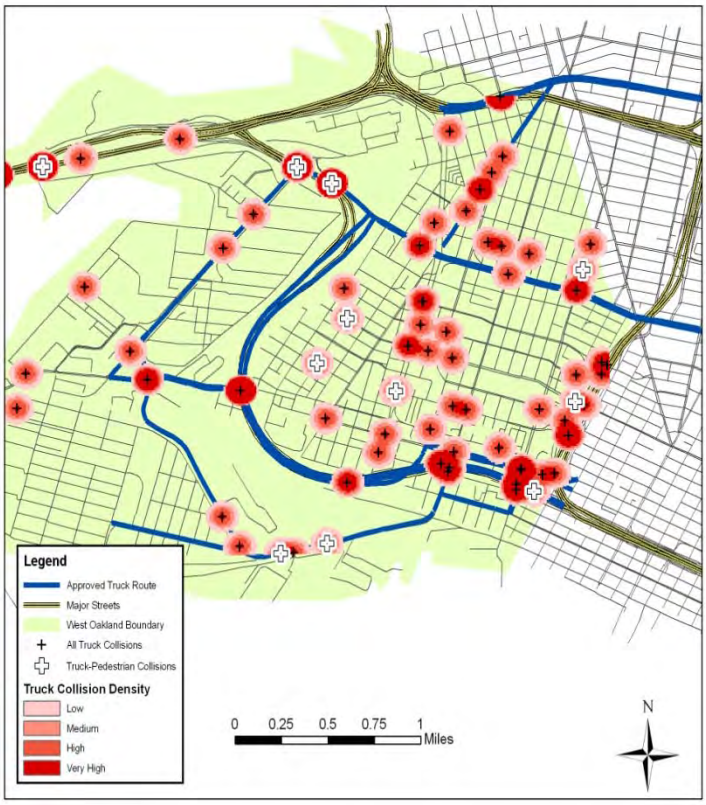
Other metrics generated to assess health determinants can be adapted for use in baseline conditions analysis. For example, the California Center for Public Health Advocacy created a Retail Food Environment Index (RFEI) based on the relative numbers of fast-food restaurants, convenience stores, supermarkets, and produce vendors. The baseline RFEI could help assess the scope, value, and impact of policies limiting or supporting alternatives to fast food outlets. CX3 is a tool developed by the California Department of Public Health Network for a Healthy California to collect neighborhood and store-level data on food and physical activity environments. Similar metrics to profile baseline health conditions could be developed to meet local needs and priorities for other issues and settings.

Mapping and Using Geographic Information Systems

Maps are commonly used in HIA to describe baseline conditions, but can also identify spatial relationships between places, populations, and environmental conditions and the joint spatial distribution of two or more conditions. Maps can illustrate the proximity of an environmental hazard in relationship to place or the presence of population and can illustrate the location of "hot spots" or spatial differences in the intensity of hazards. Furthermore, maps can illustrate the relationship between hazardous environmental condition and a vulnerability factor (e.g., sources of air pollution and presence of low-income households).

For example, air pollution, noise, and traffic hazards often share a distribution in relation to busy roadways. The map below illustrates the location and frequency of freight truck collisions related to freight routes in the West Oakland neighborhood of Oakland, California. The map used an existing state database of traffic collisions and local data on truck routes. The map, included in a HIA on maritime growth plans, illustrates spill over of truck traffic into residential neighborhoods from dedicated truck routes, indicating the need for actions to better ensure compliance to routes (UCBHIG, 2010).

Freight Routes and Truck-related Collisions in West Oakland



Maps can identify the location of community assets and resources related to health, including public infrastructure such as transit, private services like grocery stores, and natural resources like parks. This information may lead to inquiry to understand the value of these resources and their protection.

Spatial relationships among physical, economic, demographic, and health conditions depicted in maps may suggest causal hypotheses but do not necessarily prove cause and effect relationships. For example, the absence of supermarkets in areas where populations have higher rates of avoidable hospitalization for diabetes may illustrate the need for a health supporting resource but does not prove that lack of supermarkets is a principle cause of these hospitalizations or that the addition of supermarkets will lower hospitalization rates.

Maps can be used in HIA impact analysis in creative ways. In an HIA conducted to support the development of the Mac Arthur Bart transit village, existing aerial maps (accessed via google.org) served as a mechanism to evaluate the safety of pedestrian routes from the proposed village to common destinations (e.g., schools, parks).

Benchmarks and Standards

Another potential approach to analysis in HIA is to use existing qualitative or quantitative evaluative standards (e.g., benchmarks, checklists, thresholds) to assess the presence or absence of important health impacts.

EIAs commonly use an existing environmental rule or regulatory standard to determine whether an environmental effect is significant. If the measured or projected effect violates a rule or standard, then the impact is typically deemed significant. Available environmental standards are usually described in terms of a maximum level of emissions or discharges of a specific hazardous agent into the environment or a maximum acceptable level or concentration of a specific hazardous agent in an environmental medium (e.g., soil, air, water).

Using evaluative standards as a surrogate mechanism to conduct analysis in HIA is appealing because of efficiency; at the same time, reliance on such standards has several drawbacks and limitations. Formal rules or standards exist for a relatively small number of hazardous agents, noise, and radiation, and few standards exist for social and economic determinants of health. Standards for individual hazardous agents usually do not account for cumulative environmental effects. Standards may not reflect the most up-to-date scientific evidence, because they may not be revised frequently. In addition, as HIA often aims to provide a context-specific analysis, standards may have gaps or conflicts relative to local health priorities. Finally, since standard setting typically reflects both technical feasibility and political and economic considerations, standards may not be adequate to meet the actual health needs of a place or population.

Despite these limitations, it may be possible to develop health-based standards for use in HIA. The approach would require measurable and predictable outcomes, consensus on a health protective objective, and, in some cases, regulatory or legislative approval.

Some recent efforts have developed a broader set of health-relevant standards in land use planning decisions. For example, the Healthy Development Measurement Tool (HDMT; www.thehdmt.org) includes a checklist of quantitative and qualitative development targets that can be used to evaluate a typical urban development project. The development of the HDMT and these targets occurred both through a public process to select and prioritize impacts and indicators and a peer-review process to set quantitative targets (Farhang 2008). Design for Health's Thresholds Analysis Workbook (www.designforhealth.net) is a comprehensive score-based system that includes quantitative health thresholds for land use and urban planning (Forsyth 2009).

Qualitative research

Understanding local conditions and population vulnerabilities requires access to the day-to-day experiences of community members and their knowledge and perceptions of impacts. Such local knowledge (i.e., ecological knowledge) can be accessed through qualitative research including focus groups, structured and unstructured interviews, and group consensus processes. The local knowledge of community organizations and residents can complement or corroborate findings using other methods or raise additional hypotheses for research and analysis. Important local sources of expertise for HIA include community leaders, local medical providers, and public health officials. The text box above illustrates some of the health-relevant perceptions of the residents of the Trinity Plaza Apartment on their impending eviction and involuntary displacement.

Perceptions of residents facing eviction at the Trinity Plaza Apartments (SFDPH 2004):

- *[I] don't feel as I'm disturbing my neighbors when I ask for help when my sick husband has fallen and I cannot pick him up…. I know there is help around…*
- *I feel I had finally got the opportunity to settle down and be able to enjoy life at the age of 64, but now I have to worry, as I wonder where I'm going to move to when there is a lack of comparable rent in San Francisco.*
- *We are fearful, feelings are hurt, and [we're having] difficulty speaking about displacement, stressed, sleeplessness, anxiety, and the issue has been constantly going on.*

Quantitative estimation

HIA may also quantify measures of the magnitude of health impacts. Predictions in terms of common quantitative metrics (e.g., mortality, health care utilization) can also support direct comparisons among policy alternatives and economic valuation of policy costs or benefits.

Despite its desirability, quantitative estimation in HIA is not always feasible. Quantification of a prospective health effect should only occur if a causal relationship has been established between a decision effect and a health outcome and if a valid effect measure or "exposure-response" curve exists. These criteria suggest that quantitative estimation may not be possible for many of the potential health impacts of policy decisions.

Human health risk assessment (HRA) is an analytic tool commonly used in environmental regulatory analysis and impact assessment; it provides a quantitative estimate of a probabilistic risk or hazard of a physical exposure. HRA requires an established causal relationship and uses a known exposure-response function and data on changes in exposure and baseline disease prevalence. Exposure-response relationships are derived from animal or human experimental studies or epidemiologic studies and are often based on meta-analysis of high-quality studies or based on expert consensus. The output of HRA is expressed as a probability or frequency of a harmful effect on individuals or a population

resulting from environmental exposure. The HRA also documents the model, parameters, assumptions, and uncertainties used to make judgments.

Environmental regulatory agencies commonly use HRA in setting health-protective regulatory standards. For example, in a regulatory impact analysis of proposals to reduce the National Ambient Air Quality Standard (NAAQS) for PM2.5 (fine particles less that 2.5 micrometers in diameter), the U.S. Environmental Protection Agency (USEPA) determined that reducing the NAAQS for PM2.5 by 1 ug per cubic meter, from 15 to 14, would result in 1900 fewer premature deaths, 3700 fewer non-fatal heart attacks, and 2000 fewer emergency room visits for asthma each year (USEPA 2006). HRA is found infrequently in EIA as well (Steinneman, 2001).

HRA can be applied where policy effects include changes in environmental exposures. For example, forecasting impacts of a new transportation facility on respiratory disease could use predictions of motor vehicle emissions associated with changes in traffic volume and physical dispersion models to predict effects on regional and local air pollutant concentrations and then apply those exposures to pollution-respiratory disease dose-response functions. This approach has been used in several HIAs that have analyzed the impacts of new residential development adjacent to existing roadways.

Modified versions of HRA have been used to predict health impacts from changes in economic factors, such as income, in the absence of consensus on dose-response relationship. These applications have required careful consideration of the causal evidence and selection of effect measures from high-quality, externally valid studies. Using effect estimates directly from epidemiologic research, researchers have quantified changes in mortality and other health outcomes resulting from policies ranging from changes in wages (Bhatia & Katz 2001; Cole 2005 – see text box on this page), to climate mitigation strategies such as increased active transportation or decreased meat consumption. Evidence for causal relationships and quantitative effect measures or dose-response relationships exist for relatively few policy actions; this poses significant constraints for quantitative estimation, especially for innovative policies for which no empirical research exists. (See example of Menu Labeling HIA below.)

Health Impact Assessments on Two Living Wage Ordinances

San Francisco In 1999, at the request of the Board of Supervisors, the San Francisco Department of Public Health analyzed a proposed living wage ordinance for San Francisco, providing quantitative estimates of the impact of on adult health and children's development outcomes of adopting a living wage of $11.00 per hour (Bhatia& Katz, 2001). Using meta-analysis of peer-reviewed studies and effect measures relating income to health outcomes, the HIA predicted a decrease in the risk of premature death of 5% for adults 24-44 years of age in households whose current income was around $20,000. For the offspring of these workers, the analysis estimated that a living wage would result in an increase of a quarter of a year of completed education, a 34% increase in the rate of high school completion, and a 22% decrease in the risk of early childbirth. The analysis was used in city policy discussions both on the living wage and subsequent county wide minimum wage standard in 2003.

Los Angeles A 2005 HIA conducted by the UCLA Health Impact Project on the 1997 Los Angeles City Living Wage Ordinance found that both the wage and health insurance provisions of the ordinance would significantly reduce mortality among the approximately 10,000 beneficiaries (Cole 2005). The ordinance applied to employers engaged in work on city service contracts and mandated a $7.99 wage along with a $1.25 per hour contribution to health insurance benefits or an equivalent amount in additional wages. This HIA also concluded that providing health insurance was a more cost effective approach to reducing mortality than providing increased wages. The HIA did not estimate health impacts of additional ordinance provisions requiring at least 12 paid days off per year.

The table below identifies several examples in which HIA has employed data and tools to quantitatively estimate health impacts.

Examples of Quantitative Estimation in Health and Regulatory Impact Assessment

Subject / Reference	Outcomes Estimated	Data and Tools Used
State of California Ambient Air Quality Standards for Particulate Matter (CARB 2002)	▪ Mortality ▪ Respiratory Hospitalizations ▪ Acute Bronchitis ▪ Asthma ▪ Work Loss Days	▪ Concentration response functions derived from epidemiologic studies of PM 2.5 exposure ▪ California Department of Public Health mortality and morbidity statistics ▪ Difference between regional and background PM 2.5 concentrations based on state air quality monitoring networks
Neighborhoods Rezoning Plan, San Francisco, CA (CCSF, 2207)	▪ Changes in vehicle-pedestrian collision frequencies	▪ Area Level Regression Model of Vehicle-Pedestrian Injury Collisions (Wier 2009) ▪ San Francisco County Transportation Model ▪ Estimated population and vehicle trip changes associated with zoning changes ▪ Air pollution dispersion model (Bhatia & Rivard 2008) ▪ FHWA Traffic Noise Model (Seto 2007)
Pittsburg Railroad Avenue Specific Plan (HIP, 2008)	▪ Ambient particulate matter concentrations ▪ Ambient sound levels ▪ Traffic-attributable pre-mature mortality rates ▪ Noise-attributable sleep disturbance and annoyance	▪ Federal Highway Administration Traffic Noise Model ▪ Air Pollutant Dispersion Models ▪ Highway traffic volumes ▪ Meteorological data ▪ Transit service frequencies ▪ Commuter train noise measurement
San Francisco Living Wage Ordinance (Bhatia, 2001)	▪ Avoidable mortality ▪ High school graduation rates ▪ Teenage pregnancy	▪ Effect measure among income and health and child development outcomes based on controlled, prospective epidemiologic studies ▪ Bureau of Labor statistics on wages and income ▪ Future income based on current and proposed wage
Living Wage Ordinance, Los Angeles (Cole, 2005)	▪ Avoidable mortality	▪ Epidemiologic studies on income and mortality ▪ Epidemiologic studies on health insurance and mortality ▪ Estimated wage changes
Sugar Sweetened Beverage Regulatory Fee (Schneider, 2010)	▪ Share of medical expenses attributable to sweetened beverage consumption	▪ Meta-analysis of empirical research linking sweetened beverage consumption, overweight, and obesity ▪ Regression model of medical expenses and obesity status ▪ Local medical expenditure data
Redesign of Buford Highway, Atlanta (Rutt, 2010)	▪ Fatal and injury collisions ▪ Weekly minutes of walking	▪ Consensus crash reduction factors associated with transportation design interventions ▪ Observed relationship between perceived neighborhood pedestrian quality and minute of walking in San Diego
California Maximum Speed Limit Reduction (Bhabka, 2009)	▪ Changes in: greenhouse gas emissions ▪ Particulate matter emissions ▪ Fatal collisions ▪ Fuel consumption	▪ Baseline highway speed / traffic volume distribution from California Department of Transportation highway traffic database ▪ Department of Energy fuel economy data ▪ California Air Resources Board EMFAC 2007 Emissions model ▪ Expected changes in highway speeds from empirical studies on speed limit changes ▪ Empirical studies on highway speeds and injury rates

Challenges in Quantitative Estimation: the California Menu Labeling HIA

A Health Impact Assessment conducted in 2009 of "point of sale" labeling of calories in California statute estimated effects on the future weight gain of Los Angeles residents [Kuo 2009]. At the time of the HIA, there were no empirical evaluations of real-world interventions; experimental studies of menu labeling, including one with a randomized experimental design, had not demonstrated a substantial or consistent effect of calorie labeling on energy consumption [Harnack 2008].

To estimate an impact on population weight, the authors assumed that the net effect (reduction) on population-level energy balance would be the simple mathematical product of annual chain restaurant meals consumed, the number of consumers responding to the new information, the change in caloric content of individual consumers meal choices, and the calories per pound of human weight.

Calorie Labeling → Energy Choices → Consumer Weight → Population Weight

The HIA's principal prediction was that 10% percent of chain restaurant consumers ordering reduced calorie meals would result in avoidance of 40% of the weight gain in the county. The result, suggesting that responding consumers would lose four times their own expected weight gain as a result of this intervention, appeared implausible. Review of this exercise identified several likely faulty assumptions.

First, to assess the effect of self-reported influence on calories purchased, the HIA used one cross-sectional study in a single chain that had voluntarily posted calorie information. While the 100 kcal difference was substantial, the single study, in the light of contradictory experimental evidence, was not sufficient to either demonstrate a causal effect of menu labeling or generalize the effect to the intervention or to other chains or locations.

Second, the HIA assumed calories not consumed at a chain restaurant meal would translate into an equivalent change in net energy balance. The HIA cited research suggesting that neither short-term underfeeding nor overfeeding resulted in subsequent compensatory changes in food energy intake; however the same research demonstrated no effects of these interventions on body weight with the implication that food restriction or excess result in compensatory effects on energy expenditure [Levitsky 2005; Levitsky 2010].

Third, the HIA assumed that the subpopulation responding to calorie labeling restaurants would be the same as those gaining a substantial amount of weight, something that was not evident from any research.

Finally, the HIA applied forecast weight loss of responding individuals to non-responders and did not account for the eating behaviors and weight trajectories of non-responders.

While the HIA authors acknowledged the limited data, the exercise suggests that attempts to quantify effects with limited causal evidence and without externally valid effect measures may generate unreliable or implausible projections.

It is also important to consider how quantitative forecasting supports the overall objective of HIA. As all health effects of a policy choice may not be amenable to quantification, relying on quantitative forecasting exclusively may present a partial or biased accounting of health effects. Quantification can also be resource intensive and divert from other impact assessment activities.

Original Empirical Investigations

Although resource intensive, original epidemiologic studies may generate an understanding of health impacts or may develop and validate exposure-response relationships. Quantitative forecasting may require developing and validating new predictive models. For example, Weir et al. developed and validated a regression model for HIA to relate environmental characteristics to the number of vehicle-pedestrian injury collisions in San Francisco (Wier 2009). (See text box.) This model predicted the impacts of changes in land use designations on pedestrian collisions. In the HIA of the Healthy Families Act, original analysis of National Health Interview Survey data was used to evaluate the association between having paid sick days and medical care utilization (HIP 2009). Original epidemiologic investigations may be warranted if the intensity of effect is potentially large but uncertain.

Planned Growth and Pedestrian Collisions in San Francisco

To predict the effects of land use development on pedestrian safety in San Francisco, the Department of Public Health developed a county-level model of environmental predictors of pedestrian-vehicle collisions (Wier 2009). Using binomial multivariate regression, eight variables predicted 71% of the variation in ten-year averaged pedestrian-vehicle frequencies among census-tracts: traffic volume, proportion of arterial streets, neighborhood commercial land use, total land area (square miles), employee population, resident population, proportion of households in poverty, and proportion of residents older than 65. Planning data, including data on future resident and employee populations and traffic volumes, provided parameters for the model to estimate prospective impacts on pedestrian-vehicle collisions. The plans projected a 15% increase in traffic volume and a 16% percent change in populations. The model forecast that planned growth in four historically industrial and mixed-use neighborhoods would result in a cumulative 17% increase in 5-year pedestrian injury collisions or over 30 additional collisions each year. Forecasts for individual neighborhoods demonstrated substantial variation in hazards for new residents.

Analysis of disproportionate effects and environmental justice

Health inequities are systematic disparities in health status or in the major social determinants of health between groups with different social advantage/disadvantage (e.g., wealth, power, prestige) (Braveman 2003). An explicit objective of HIA is to prevent public policies from generating or perpetuating health inequities.

Identifying and addressing disproportionate health effects through HIA can help fulfill federal government mandates for environmental justice. USEPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from the execution of federal, state, local, and tribal plans, programs and policies.

Executive Order 12982 charged federal agencies to make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions (Clinton, 1994). A Presidential memo accompanying the order further charged agencies to analyze and mitigate disproportionate impacts though the NEPA process.

Determining whether an action will cause adverse health effects disproportionately burdening a socially excluded population requires evaluating four factors (CEQ 1997; USEPA 1998; USEPA 1999):

Impacts on Health Disparities: HIA of California Ballot Proposition 49 (UCLA, 2002)

California Proposition 49, passed by voters in November 2002, increased mandatory state funding for after-school programs from $117.5 million per year to $550 million per year. An HIA conducted by the UCLA Health Impact Project in 2003 found that while this reallocation theoretically could produce significant health benefits for low-income youth by decreasing rates of risky behaviors, reducing criminal activity, and raising participants' socio-economic status by improving educational achievement, the lack of strict means-testing for program eligibility could result in a decreased proportion of after-school program funds directed towards low-income students and schools. Furthermore, reallocation of up to $550 million per year from the state's general fund to after-school programs could necessitate budget cuts to health and social service programs. Rules subsequently promulgated by the California Department of Education targeted Proposition 49 funds to low income schools and students.

(Report available at: http://www.ph.ucla.edu/hs/health-impact/reports.htm)

1. Whether the action will have significant adverse health or environmental effect on a vulnerable population (e.g., low income, elderly, ethnic minority);
2. Whether the magnitude of the adverse effect (e.g., the risk or rate of hazard exposure) on that population is likely to exceed the risk or rate to a comparison group in the general population;
3. Whether the effect will contribute cumulatively to a pre-existing adverse condition or exposures; and
4. Whether attributes common to a vulnerable population will mediate or exacerbate an adverse health effect on the population.

For this last factor, the disproportionate health or environmental effects on vulnerable communities may occur both because of proximity to a hazard (e.g., greater exposure to pollution) and a shared vulnerability (e.g., higher prevalence of a disease), a shared cultural practice, or unique dependence on an impacted environment resource (e.g., locally caught fish for sustenance).

HIA should consider and analyze disproportionate impacts or environmental justice. In general, the data and tools required to analyze disproportionate impacts are no different from the tools used in impact analysis. Demographic data may indicate the presence and location of socially vulnerable communities, GIS tools may help spatially correlate impacts with the location of affected populations, and local public health data may bring attention to health sensitivities of local populations. Known health concerns about a project or plan among members of lower-income or socially marginal communities should sensitize the HIA team to the potential for disproportionate impacts and the need for rigorous consideration.

Cumulative Effects

Cumulative effects are the combined and incremental effects of human activities on environmental resources, human communities, or ecosystems (40 CFR §1508.7.; USEPA 1999). Many analytic methods can be used to quantitatively assess cumulative effects. Effects may be combined spatially (e.g., modeling multiple point sources of the same hazardous exposure on a receptor), temporally (e.g., incremental air pollution due to additions to roadway capacity), or as the combination of exposures or hazards with common mechanisms of toxicity (e.g., cholinesterase inhibition) or effects on the same biologic endpoint (e.g., cancer). Cumulative effects analysis may also involve assessing joint effects of dissimilar exposures with dissimilar mechanisms of actions, although this is more difficult and combining multiple effects in terms of a single health outcome metric may not be possible. One study associated a combination of noise and overcrowding (two environmental conditions associated with poverty) with higher stress and stress hormone levels in children (Evans 2004).

Assessing and quantifying the health effects of cumulative, place-based exposures is an important, emerging research area for public health and environmental science. A National

Cumulative Effects of Location and Regional Traffic on a San Francisco Neighborhood (Wier 2009)

In response to community concerns, the San Francisco Department of Public Health (SFDPH), PODER (People Organizing to Demand Environmental and Economic Rights) and the University of California, Berkeley School of Public Health (UCB) collaborated to research the impacts of local and regional freight and automobile traffic on the Excelsior/Southeast area of San Francisco. Methods employed included air quality and noise modeling and monitoring, community surveys, secondary data analysis, traffic counting, community photography, and surveys of the physical characteristics of the pedestrian environment. The assessment revealed heavy local cut-through traffic; adverse impacts of regional freeway traffic on local noise levels and air quality; residential concerns regarding traffic hazards, trucks, air pollution, and traffic-related sleep disturbances; and impacts on a predominantly non-white, immigrant community.

With this assessment, PODER, community members, and key community allies mobilized to demand the Board of Supervisors resolution direct SFDPH, the San Francisco Municipal Transportation Agency, and local legislative staff to identify protective truck routing policies. The case study was unique in its focus on the cumulative impacts of transportation planning policy decisions on local residents considering the transportation infrastructure, not pollution emissions, as the fundamental source of environmental hazard.

Academy of Sciences consensus report on risk assessment concluded that there is a need for such assessments to include "…combined risks posed by aggregate exposure to multiple agents or stressors; aggregate exposure includes all routes, pathways, and sources of exposure to a given agent or stressor. (Committee on Improving Risk Analysis 2008). Although it may not be possible to quantify all health effects and quantification may not describe effects using the same metric or measure, HIA can support the understanding and consideration of cumulative effects by analyzing multiple effects unconstrained by the need for a common metric. The example in the text box illustrates how transportation systems impacts may act "cumulatively" on the human community and offer areas for further research.

Economic valuation of interventions and health impacts

Occasionally, the decision-making process may need to place an economic value on health impacts in comparing economic benefits against costs or in comparing the relative cost effectiveness of alternative strategies. For example, cost-benefit analysis is routinely required in the evaluation of federal environmental regulations and interventions. Cost-benefit evaluation of regulations compares the economic cost of regulations with the economic benefit indirect and direct costs of averted heath impacts.

Cost Benefit Analysis of Greenhouse Gas Regulations

A Congressional Budget Office cost-benefit analysis of the American Clean Energy and Security (ACES) Act predicted that the Act would cut greenhouse gas emissions in capped sectors by nearly 12% in 2020 and that the net annual economy wide cost of the cap-and-trade program in 2020 would be $22 billion—or about $175 per household.

Economic valuation of health effects can be applied based on a quantitative HIA if data exist to place a monetary value on the analyzed health effects. Data are available to assign economic values to outcomes such as years of lost life, loss of quality of life, health care utilization, and the loss of employment.

For example, HIA may produces estimates of impacts on unintentional injuries such as road injuries suffered by pedestrians. Vehicle injuries to pedestrians have significant economic costs. An analysis of 1999 California data on vehicle injuries to pedestrians revealed over $3.9 billion in direct and indirect costs ($692,000 per injury).

Estimates of economic costs of pedestrian injury by injury severity in California.

Pedestrian Injury Severity	Economic Cost per Injury
Fatal Injury	$ 2,709,000
Severe Injury	$ 180,000
Visible Injury	$ 38,000
Complaint of Pain	$ 20,000

Cost-benefit analysis is a distinct, related, decision-support tool that might use results from an HIA. As an example, the City Controller of San Francisco conducted a cost-benefit analysis of proposed air quality regulations for enhanced building ventilation in residences near busy roadways (Office of the Controller 2008). The annual cost of the most expensive mitigation approach, individual unit ventilation systems, adding operating and maintenance costs, and accounting for the space to accommodate the system, was estimated at $727 per unit per year. On the other hand, estimates of the

health benefits, using methods developed for HIA, were valued at about $2,100 per unit per year.

Unlike HIA, cost-benefit analysis aims to provide a "bottom line" evaluation of the desirability of a decision using a common, monetary metric. This relies on the assumption that all important effects of a decision, positive and negative, can be valued and expressed in monetary terms. Economic valuation may undervalue public goods and may value health differently in different populations (e.g., populations not in the labor force). Economic valuation of health and welfare outcomes raises particular methodological and ethical issues, including how to value health and life and how to value the present costs of latent impacts (Revesz 1999).

A complete discussion of methods, applications, and limits of economic valuation is beyond the scope of this guide. USEPA has published guidelines for economic analysis that may be a resource for economic valuation in HIA (USEPA 2000). Brodin and Hodge (2008) have also recently discussed several common issues in the application of economic valuation in HIA practice.

Validity of Judgments in Impact Analysis

HIA applies available knowledge and theory to make reasoned judgments about the future (Veerman, 2007). The task of prediction in HIA is somewhat analogous to the task of diagnosis and prognosis in medical practice where a practitioner applies training and experience, a patient's history, and diagnostic tests. Prognosis in medicine assumes uncertainty and the possibility of error, the need for monitoring, and future adjustment to therapy; the quality of clinical judgment is evaluated against those made by peers in similar situations.

Similarly, within HIA, the validity of judgments rests on whether the judgment is plausible, is based on sound scientific evidence, applies good judgment, and acknowledges uncertainty. Principles for the ethical use of evidence are outlined in the IAIA HIA Practice Principles (Quigley 2006) and include considering and valuing all forms of evidence and acknowledging uncertainty.

Judging the quality of evidence is not straightforward. Use of accepted scientifically valid methods, peer-reviewed evidence, and systematic reviews are three possible criteria for judging evidence quality. But the lack of robust, formal, scientific evidence should not preclude reasoned, experience-based predictions. Informed judgments of health effects can be based on available information while recognizing data and evidence limitations.

Some Principles for the Ethical Use of Evidence in HIA

- Consider evidence, both supporting and refuting *a priori* hypotheses, from diverse sources including available statistics, empirical research, professional expertise, local knowledge, and the products of original investigations.
- Use evidence from well-designed and peer-reviewed systematic reviews.
- Justify the selection or exclusion of particular methodologies and data sources.
- Make explicit any assumptions, particularly quantitative estimates of hazards or impacts.
- Identify data gaps, uncertainties, and limitations.
- Allow stakeholders to critique the validity of findings.

Valuing all forms of evidence means that, in addition to traditional sources of data and expertise, the assessor considers local knowledge. In general, the use of diverse and complementary approaches supports better judgments. Transparency demands documenting sources of evidence and methods, including literature search strategies; justifying the use or exclusion of particular methods; and acknowledging when insufficient information exists to assess health impacts.

Predictions must document all of the assumptions used. For example, a prediction may assume presence or persistence of certain environmental, social, or economic conditions or the applicability of findings in one population to other populations. An HIA should qualitatively assess the uncertainty of findings and predictions and acknowledge assumptions in forecasting methods and inferences from empirical work. Allowing experts and stakeholders to criticize HIA findings through opportunities for public comments on a draft report can help identify such limitations.

An HIA should consider how effects may be mediated by conditions of a particular place or time. For example, health impacts of a decision to convert farm land to residential

uses will depend on the remaining agricultural resources and who controls or owns those resources. Similarly, health impacts of a decision to demolish and redevelop existing housing will depend on the supply and cost of remaining housing. Health effects also will depend on particular vulnerability or resiliency factors in a community. A population may have greater susceptibility to a specific health impact because of a demographic characteristic (e.g., poverty, the susceptibility of the young to pedestrian injuries), a higher prevalence of certain health conditions (e.g., asthma), environmental hazards or stressors (e.g., noise), or cultural dependence on natural resources (e.g., sustenance consumption of local wildlife).

When using complex mathematical models to make quantitative estimates, sensitivity analysis (SA) can help examine the relative importance of uncertain data inputs on predicted outcomes. SA can employ various techniques but generally varies the input parameters for a model based on some assumed distribution. Examples of SA exist in environmental and public health assessments and in cost analysis.

HIA practitioners need to be attentive to sources of bias in judgments. Bias in HIA may result from stakeholder, decision-maker, or regulatory agency influence on a practitioner or a practitioner's own interest. Bias can lead to HIA practitioners overstating or understating impacts or their certainty. Bias can result in omitting a significant impact analysis question in the scoping process (so-called type III error).

Impacts of Paid Sick Days on Influenza Transmission

Judgments made in the HIA on the California Health Families Healthy Workplaces Act provide an example of managing limited and uncertain data. In this HIA, the assessment team reviewed evidence that could support the hypothesis that paid sick days would reduce the health impact of an influenza pandemic (SFDPH 2008). No specific studies had addressed this question directly and few studies had looked at the health effects of paid sick days. Available evidence established the following facts: (1)based on models using the best available evidence, interventions that limited social contacts could be expected to reduce pandemic flu cases 15-34%; (2) the benefit of the intervention was a function of the rate of compliance; (3) employees who had paid sick days available, took, on average, one day more per year of leave for sickness (about 1/3 more days); (4) paid sick days benefits were held by about half of the working population and disproportionately held by those with higher income; and (5) pandemic influenza could result in 100 million infections in the United States. From this indirect evidence the authors concluded that a uniform requirement for paid sick days would significantly reduce the consequences of an influenza pandemic with a moderate to high degree of certainty. The judgment recognized that quantifying the health impact required more data on the relationship between paid sick days and compliance with social distancing measures.

Assessment of the Significance of Impacts

Most regulatory environmental impact assessments include assessment of impact significance. Significance of impacts relates both to objective characteristics of impacts and to how societies value or prioritize these characteristics. Clearly important is the magnitude or intensity of the impact and its extent over time and space. Other characteristics of impacts include the certainty of whether an impact will occur, whether the impact adds or acts cumulatively with other impacts or existing conditions, whether

there are distributional effects (inequities), whether the impact is reversible or permanent, and whether the impact can be mitigated.

Some health impacts and health-relevant environmental conditions have established quantitative criteria for impact significance. In these cases, legal decisions, regulatory standards, or established policy goals (e.g., National Ambient Air Quality Criteria, Healthy People 2020) can provide the basis for judgments of significance in impact assessment. However, as discussed above, established benchmarks may not reflect local values or exist for the breadth of impacts likely to be included in HIA.

Judgments about social significance are understandably normative. Objective characterization of the magnitude, direction, and certainty of health impacts does not necessarily equate to conclusions about the social significance of impacts. Social significance involves additional value judgments made outside of and apart from the HIA process. Social values or priorities (e.g., adversity to risks, relative value of individual or collective risks) can vary considerably among and within populations and places and values related to the acceptability or unacceptability of impacts often conflict among affected populations. Public decisions typically have multiple potential health effects. Thus, summative judgments in HIA will often require evaluating trade-offs or cumulative impacts of dissimilar effects described with dissimilar metrics. For these reasons, the social significance of impacts characterized in HIA should be determined in a transparent process by stakeholders and the affected community apart from the HIA process.

Using consensus processes for making judgments

Group or consensus processes to synthesize evidence may support summative judgments and make transparent the moderating effects of values and biases on these judgments. For example, in the Delphi method, a panel of experts answers a question iteratively and is given the opportunity to revise answers after reviewing an anonymous summary of other experts' forecasts. The intent is for the group to converge towards a consensus.

Deliberative processes can also bring together scientific experts and stakeholders, facilitating more inclusive participation in HIA judgments. For example, in the Danish Board of Technology's Consensus Conference, a lay panel deliberates and develops a consensus on a particular science or technology issue and experts contribute testimony and analysis in response to questions posed by the lay panel (Anderson 1999). Habitat Conservation Planning provides another example of consensus-building among diverse and conflicting interests as an alternative to command and control environmental regulations (Sabel 2000).

Criteria for Alternatives and Mitigations

- Responsive to projected impacts
- Specific and actionable
- Experience-based and effective
- Enforceable or susceptible to monitoring
- Technically feasible
- Politically feasible
- Economically efficient
- Meet multi-objectives
- Do not have additional negative consequences

Strategies for Policy Design and Implementation

A key function of HIA is to identify and analyze opportunities for a decision to respond to health needs. The HIA may identify alternative ways to design a policy, program, project or plan, its location, or its timing to benefit health or incorporate mitigation and management strategies to lessen anticipated adverse health effects. HIAs could also suggest ways to monitor potential but uncertain impacts or identify needs to enhance communication with stakeholders. Strategies recommended by an HIA should be responsive to and grounded in the findings of impact analysis.

It is not always necessary or appropriate for an HIA to include recommendations. HIA primarily analyzes impacts. For example, HIAs of legislative initiatives on minimum wage and paid sick day requirements in California documented health impacts but did not endorse positions on these policy choices or offer alternatives. An HIA may inform a decision with discrete choices and limited alternatives. Decisions made during scoping may also limit the role of the assessment in proposing changes to the policy under review.

Describing a complete process to identify the breadth of potential alternatives and mitigations is beyond the scope of this guide. Developing, evaluating, and prioritizing strategies, whether alternatives or mitigations, first requires a clear understanding of a proposed project, plan, or policy and knowledge and research of existing policy implementation, design practices, and mitigation. Typically, considering alternative policy designs requires consultation with others, as the HIA team may lack expertise to provide recommendations. This underscores the need for HIA to be an interdisciplinary analysis. The skills and expertise needed to identify and analyze alternatives and mitigations are often different from those needed to identify and analyze health impacts. These skills may lie with project proponents, others who are familiar with project design and implementation, community members, and other professionals. Communication with policy makers/developers and stakeholders is often needed to gauge the buy-in or feasibility of policy changes.

HIA should provide substantive analysis of why recommended changes are justified and beneficial. If possible, HIA should estimate effects of recommended mitigations on health outcomes. Including and implementing mitigations and alternatives into a project or policy design could also be supported by evidence of feasibility, efficiency, cost benefit, cost-effectiveness, and political acceptability. Further analysis might test the sensitivity of outcomes to a design change.

Eastern Neighborhoods Rezoning and Area Plans, San Francisco, 2007

Participating as part of a team conducting the environmental impact assessment for the Eastern Neighborhoods Rezoning and Area Plans, staff from the San Francisco Department of Public Health analyzed conflicts between industrial uses, roadways, and proposed new residential uses and found that the rezoning would substantially increase human health hazards from noise, air pollutants, and pedestrian collisions. The Department proposed that projects in proximity to high traffic volumes assess the concentration of PM 2.5 from traffic sources and include ventilation and filtration systems where exposure levels were above a pre-defined threshold.

HIA practitioners should be mindful that identifying and incorporating mitigations may not always result in policy decisions that are healthful or ethical in a holistic sense. For example, a decision to incorporate mitigations may provide needed political support for policy adoption even though those mitigations may only offer partial relief from adverse health impacts of a policy. Because HIA typically looks at multiple health-related outcomes, it is important to provide an evaluation of a policy holistically, with and without available and recommended design alternatives.

Public Housing Flooring Policies, San Francisco, 2003

In 2003, as part of public-private partnerships to reduce avoidable asthma exacerbations, the San Francisco Department of Public Health facilitated a HIA on alternative policies for flooring in publicly constructed or subsidized housing. The HIA process involved public meetings, dialogue, and knowledge sharing among residents, advocates, housing authority staff, and health experts, supplemented with resident surveys. Considering health and legal and economic feasibility, the HIA recommended that the Housing Authority set aside a proportion of new units to be carpet-free for tenants with asthma and that the Authority educate tenants on reasonable accommodation provisions that would facilitate carpet removal for affected tenants. Local legislators and the Housing Authority approved both recommendations.

V. REPORTING

Objective:

- **Communicate the findings and recommendations of an HIA in the decision-making processes.**

The HIA report provides a description of the process, a succinct and coherent statement of the potential health impacts of a proposal and its alternatives, and any recommended mitigations and measures to prevent negative impacts or strengthen health benefits. The report forms the basis for communication with decision makers, responsible administrators, and stakeholders.

A comprehensive report should identify all the participants and their roles in the HIA, describe the scoping process, and describe assessment outcomes. The report should, for each issue analyzed, discuss the available scientific evidence, profile existing conditions, describe analytic methods, document and interpret analytic results, characterize the health impacts and their significance, and, if necessary, list recommendations for policy, program, or project design alternatives or mitigations. If included, recommendations for decision alternatives, policy recommendations, or mitigations should be related to impacts and justified with regards to both feasibility and efficacy.

HIA reports should be succinct and based on evidence collected, used, and synthesized during the process. A successful report often focuses attention on the key information, whether impacts or alternatives, necessary to drive action. The HIA report may include detailed technical appendices or reference more detailed studies that provide the basis for judgments and recommendations.

Findings may be reasonably prioritized based on overall magnitude of health benefit, impact on vulnerable populations, and perceived public concerns; however, HIA best serves health interests by reflecting a complete, objective, and transparent rendering of the process.

Effective reporting requires presenting the findings and recommendations in ways meaningful to different target audiences and stakeholders. An HIA report often forms the basis for more targeted communication (e.g., fact sheets, public testimony, panel discussions, graphic and visual illustrations, comments on regulatory decision-making and peer-reviewed publications).

The HIA reporting process should offer stakeholders and decision-makers a meaningful opportunity to critically review evidence, methods, findings, conclusions, and recommendations. Ideally, a draft report should be made available and readily accessible for public review and comment. Upon receipt of comments, the HIA team should address substantive criticisms either through a formal written response or through report revisions. The final HIA report should be publicly accessible.

Key Elements of HIA Reports	
Element	**Rationale**
Policy objective(s)	HIA aims to provide a holistic assessment and policy objectives may be health promoting. Understanding the policy objectives is critical to considering trade-offs among cost and benefits.
Design features or parameters of the policy, plan, or project and design alternatives	The impacts of a policy are dependent on its design; mitigation strategies typically involve changes to design parameters. Analysis and consideration of mitigations must be grounded in an understanding of the proposed design. For example, if the HIA describes a proposal to mine coal, it should also describe facilities needed to transport coal and plans to reclaim land after coal extraction.
Documentation of the scoping process and its outcomes	All HIA analysis flows from the scoping process. Decisions on what to study and what methods to use should be transparent so readers understand why assessors focused on particular impacts or used particular analytic choices.
Profile of baseline conditions relevant to health impacts	Prospective health impacts are dependent on baseline health conditions. For example, the impact of a freeway expansion on asthma hospitalization rates would be worse in communities with high baseline asthma prevalence.
Impact analysis and judgments of significance	While reports should be succinct, HIAs should transparently report on all impacts analyzed whether findings are adverse or beneficial, significant or insignificant. Failure to do so could bias decision making and raise public concerns about the quality of the decision-making process. Impact analysis also justifies proposed mitigations and alternatives.
Vulnerable populations and disproportionate impacts	An impact may have no appreciable health effect on a population as a whole but may significantly impact a subpopulation. For example, a project that results in poisoning local fish populations may have marginal nutritional impact on most residents but may severely negatively affect the nutrition of subpopulations culturally or economically dependent on fishing.
Assumptions and parameters used in assessment models	The validity of predictions often depends on the validity of assumptions. For example, prediction models based on national data may not be valid if there are substantial differences between national and local populations.
Determination of significance or non-significance	Significance or acceptability is a subjective judgment that should be validated against the norms of a place or context. Assessors should not judge an impact as non-significant without reference to an established standard or public process for making that determination. For each impact, the report should clearly identify any existing and relevant environmental or health standards, objectives, or targets in a community.
Proposed alternatives or mitigations along with evidence of their feasibility and effectiveness	Alternatives and mitigations proposed in an HIA require substantive analysis that considers the efficacy of mitigation in addressing the impact and, its political and technical feasibility.

VI. MONITORING

Objective:

- **Monitor the implementation of the policy decision and its outcomes on health determinants and health status.**

Monitoring refers to tracking how a decision is implemented and the resulting health outcomes. Monitoring allows stakeholders and policy makers to see the actual adverse health impacts that result from a policy decision and can provide evidence required for reevaluating or adapting a policy. Monitoring can provide an early warning system to detect unexpected or uncertain adverse outcomes.

The first step in monitoring is identifying key processes and outcomes for tracking. Similar to indicators used for profiling baseline conditions in the analysis phase of HIA, appropriate indicators for monitoring can include health outcomes, health-relevant behaviors, and health determinants. Monitoring ideally requires collection of these indicators before, during, and after policy implementation. Process monitoring may focus on conformity with an agreed-upon design or implementation process for the policy, program, or plan or compliance with required mitigations or regulations.

Essential Tasks in Monitoring

- Define implementation tasks, outcomes, and indicators for long-term monitoring.
- Identify a lead individual or organization to conduct monitoring.
- Develop a monitoring plan or program, including a plan to report monitoring findings to decision makers and HIA stakeholders.
- Ensure resources to conduct, complete, and report the monitoring.

If monitoring will include health status outcomes, the HIA team should consider issues of latency and specificity in relation to implementation of decisions. Monitoring can observe changes in health outcomes expected to shift rapidly with shifts in environmental conditions. For example, roadway collisions and injuries may be expected to change contemporaneous with changes in vehicle traffic volumes or roadway conditions. Long lag times between decisions and their implementation or between implementation and health endpoints can limit the feasibility of observing changes in health outcomes. Similarly, it is challenging to interpret changes in indicators when health outcomes are influenced by multiple individual and community level determinants (e.g., hospitalizations for diabetes).

Monitoring cannot generally provide conclusive answers to questions of cause and effect. If recommendations are implemented to prevent adverse health outcomes and long-term monitoring reveals little change in health indicators, it may not be possible to determine with certainty whether this is due to effective mitigation of adverse health effects or to imprecise predictions regarding the impact itself. Still, monitoring may be

useful to test the predictive judgments of impact analysis, check the validity of impact analysis tools, or provide lessons for subsequent analysis.

Resources for conducting an HIA may not include resources for long-term monitoring; however, HIA can still include a recommended monitoring plan. Mitigation monitoring plans with reporting to regulatory or decision-making agencies are commonly used in EIA. Also called environmental management plans or impact management plans, a mitigation monitoring plan documents mitigation measures and agency responsibilities and roles in ensuring and documenting mitigation achievement.

Mitigation monitoring plans typically list a summary of the potential impacts requiring mitigation, a description of required mitigation measures, responsibilities and a schedule for implementation, requirements for surveillance and auditing, and triggers and contingency actions to address excessive or unexpected impacts. Public agency and project proponent responsibilities for mitigation and monitoring should be clearly defined, including arrangements for coordination and disclosure.

VII. STAKEHOLDER PARTICIPATION

Inclusive and meaningful participation of affected residents and other stakeholders in the policy making process is a fundamental hallmark of democracy and social justice. Historically, decision making has been largely tied to power and/or expert driven and has allowed only limited opportunity for meaningful and open participation (Arnstein 1969). Recently, more deliberative and inclusive public participation processes have emerged. (Fischer 2000).

Within a HIA process, participation of diverse stakeholders can help identify relevant research questions, sources of data and information, and proposals for alternatives and mitigations. Meaningful and inclusive public participation can also ensure that the HIA addresses community priorities and makes judgments that take into account community values.

Stakeholders may include individuals or groups with a known or perceived interest in the outcomes of a decision that is the subject of a HIA, including residents, employees or employers, sponsors of economic development projects, health providers or public health officials, and government agencies responsible for policy implementation or enforcement.

While stakeholders may hold opposing positions on decision alternatives, all stakeholders have contributions to make to an HIA. Residents are most often the best sources for identifying community priorities. Project proponents are likely to have knowledge about the feasibility of alternatives. Health providers bring essential information about the health status and vulnerabilities of community members. Environmental agencies may have data on environmental conditions relevant to health.

If experts or public institutions are directing or leading an HIA, the process can include significant opportunities for stakeholder participation. For example, HIA practitioners may convene community residents to participate in a scoping process to better focus research questions on community priorities. In the assessment phase, practitioners may use focus groups to gain insight and knowledge about health effects and mitigation strategies. Analysis of alternatives can involve a dialogue with experts, project proponents, and policy implementers. The table below provides other examples of possible community roles in stages of the HIA process.

Stage of HIA	Example of Community and Stakeholder Involvement
Screening	▪ Community stakeholders identify the need for and create political demand for an HIA
Scoping	▪ Community stakeholders participate in or conduct scoping exercises to identify high priority community health issues and concerns
Assessment	▪ Community members and stakeholders participate in interviews and focus groups conducted by staff ▪ Community members organize, develop, and conduct a survey ▪ Stakeholders interpret or "ground truth" staff research
Reporting	▪ Stakeholders interpret and prioritize findings and recommendations ▪ Stakeholders report and communicate HIA findings to the media and decision makers
Monitoring	▪ Stakeholders create a "watchdog" group and monitor decision outcomes and long-term results

Stakeholders such as affected community organizations may also have the capacity to take a more direct leadership role in the organization and conduct of the HIA process. For example, a community organization could call for an HIA, organize a team to conduct it, conduct a public scoping process, and provide overall ownership and oversight of the process. In this case, experts would serve a community-led process in a range of supporting roles including facilitation, research, data collection, analysis of impacts, and public testimony. An HIA to analyze the health impacts of growth at the Port of Oakland involved collaboration among community stakeholders with a memorandum of understanding among parties to define roles and responsibilities.

VIII. EVALUATION

Evaluation concerns both the HIA process and its outcomes or impacts (Taylor 2003). Evaluation is important to developing HIA practice and providing lessons to practitioners and others interested in institutionalization of the field. However, HIA evaluation is a nascent field and while several authors have suggested evaluation frameworks and measures, definitive guidance does not yet exist (Wismar 2004; Parry 2005; Mathias 2009).

Process evaluation may provide valuable insight into ways to improve the relevance and legitimacy of the process, the accuracy of predictions, or the translation of the findings to decision makers. The North American Consensus Practice Standards forms one set of criteria for the process that might serve in evaluation (North American Practice Standards Working Group 2009).

Outcomes evaluation is a longer-term undertaking that focuses on the influence of the HIA on the decision-making process and outcomes. HIA presumes that informing decision makers of health impacts can identify or motivate beneficial and protective changes to the design of a project or policy, lead to decision alternatives, or influence the adoption of a policy. Such effects can result from the rational use of information by decision makers or the political use of information by interest groups.

Outcomes evaluation for HIA should also consider impacts on the future climate for HIA and other indirect or unanticipated effects (Wismar 2004). HIA is a vehicle for institutional and social learning and may have important outcomes in the way decision makers think about the health in policy making, in the ways institutions integrate health considerations into policy design; and on relationships between the public health community and institutions outside the health sector.

Outcomes evaluation requires both commitment and resources. The simplest form of evaluation may involve an assessment team and HIA sponsors reviewing and reflecting on the HIA outcomes against objectives established in the screening phase. A more complete evaluation will identify an individual or organization to lead the evaluation, identify key evaluation questions and data sources, and ensure resources to complete and report the evaluation to decision makers and stakeholders.

Questions for HIA Outcomes Evaluation	
Effects on design, adoption, or implementation of the project/policy	• Did the project or policy include a design change or mitigation to protect or promote health? • Did decision makers consider or adopt an alternative to address health needs? • Did decision makers postpone the decision to conduct further research on health issues?
Effects on the political environment for the policy decision	• Were new connections between the decision and health evident in the media, statements by public officials or stakeholders, public testimony, public documents, or policy statements? • Are new interest groups (e.g., public health advocates) supporting or opposing the decision?
Effects on institutional practices concerning health in decision making	• Are public health institutions more engaged in policy evaluation in other sectors? • Are there greater public or institutional supports or resources for HIA? • Are there efforts to institutionalize health analysis or health criteria into policy design and decision making?

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APPENDIX I.

Practice Resources

International Websites

- HIA Community Wiki – www.healthimpactassessment.pbworks.com
- World Health Organization HIA website – www.who.int/hia/en/
- HIA Connect (Australia) – www.hiaconnect.edu.au/
- HIA Gateway (UK) – www.apho.org.uk/default.aspx?QN=P_HIA
- London Health Commission – www.londonshealth.gov.uk/hia.htm

U.S. Government Websites

- National Association of City and County Health Officials (USA) – www.naccho.org/topics/environmental/landuseplanning/HIA.cfm
- Centers for Disease Control and Prevention – www.cdc.gov/healthyplaces/hia.htm
- San Francisco Department of Public Health – www.sfphes.org

University HIA Education, Research and Practice Programs

- University of California, Los Angeles – HIA Clearinghouse Learning and Information Center – www.ph.ucla.edu/hs/hiaclic
- University of California, Berkeley Health Impact Group – http://sites.google.com/site/ucbhia/
- University of Minnesota, University of Colorado, and Cornell University – Design for Health – www.designforhealth.net/
-

Private HIA Practitioners

- Human Impact Partners – www.humanimpact.org
- Habitat Health Impact Consulting – www.habitatcorp.com

Guidance for Health, Community, and Social Impact Assessment

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- US Environmental Protection Agency. 2001. Our Built and Natural Environments. Washington DC. Available at: www.epa.gov/dced/pdf/built.pdf

Health, Social, Economic, and Environmental Indicators

- Healthy People 2010. Leading Health Indicators – www.healthypeople.gov/lhi/
- National Center for Health Statistics – www.cdc.gov/nchs/
- WHO Statistical Information System – www.who.int/whosis/en
- U.S. Census Bureau – www.census.gov/
- U.S. Bureau of Labor Statistics – www.bls.gov/
- U.S. Department of Health and Human Services - Community Health Status Indicators Report – www.communityhealth.hhs.gov/homepage.aspx?j=1
- Healthy Development Measurement Tool – www.thehdmt.org
- USEPA Environmental Indicators Gateway – www.epa.gov/indicators/

APPENDIX II.

Integrating Health and Environmental Impact Assessment

Environmental Impact Assessment (EIA) refers to a practice of integrated impact analysis of governmental actions typically conducted to meet statutory or regulatory mandate. The practice developed to serve regulatory requirements under the 1969 National Environmental Policy Act (NEPA) (CEQ 1997). Both NEPA as well as related State laws require analysis of certain direct and indirect health effects of projects, generally when the project will involve a major change in the physical environment (CEQ 1978 §1508.8; EQ 1978 §1508.27; CEQ 1997; EPA 1998)

The 1969 National Environmental Policy Act (NEPA) charged the Federal government agencies "to use all practicable means, consistent with other essential considerations of national policy" to "assure for all Americans safe, healthful, productive and aesthetically and culturally pleasing surroundings" (NEPA 1969 §4331). The law requires that any major federal action significantly affecting the quality of the human environment must undergo an evaluation and public disclosure of its environmental effects (NEPA 1969). The Council on Environmental Quality (CEQ) which promulgates regulations for implementing NEPA (40 CFR 1500-1508) emphasizes that the "human environment" is to be "interpreted comprehensively" under NEPA to include "the natural and physical environment and the relationship of people with that environment" (40 CFR 1508.14). NEPA regulations further define “effects” as those that are “…ecological, aesthetic, historic, cultural, economic, social, or **health**, whether direct, indirect, or cumulative,” (CEQ 1978 §1508.8).

Health should be an explicit factor in determining the significance of environmental effects. According to NEPA regulations, the significance of an action must be analyzed at the level of society as a whole, the affected region, the affected interests, and the locality and may vary by settings. Judgments of intensity, or severity should reflect the particular characteristics or vulnerabilities in an area or context (e.g., proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, endangered species or ecologically critical areas) and consider the degree to which a proposed action affects **public health or safety**, the degree to which effects are controversial or uncertain, the opportunity for an action to establish a precedent for future actions, the potential for an individually insignificant action to be cumulatively significant, and the potential for an action to violate Federal, State, or local law or requirements imposed for the protection of the environment. (CEQ 1978 §1508.27) The U.S. Centers for Disease Control has an official regulatory role in reviewing of health effects in EISs conducted by Federal agencies.

HIA may offer one approach to conduct an integrated health analysis as part of the EIA process, and has recently been used in several jurisdictions to fulfill regulatory requirements under NEPA or similar state laws. (Davies & Sadler 1997; Bhatia and Wernham 2008).

Stage in EIA	Requirements Relevant to Health Analysis
Screening	Under NEPA, federal agencies conduct an EIS when they determine their action to be a "major federal action significantly effecting the quality of the human environment" (NEPA Sec. 102 [42 USC § 4332]).
Scoping	When an EIS is required, agencies are required to conduct analysis of any health effects of the action. Agencies can determine the need for and type of health analysis based upon knowledge about community health status and environmental conditions and social vulnerabilities. This information is available through public hearings, literature review, and consultation with local health agencies and other health experts. NEPA does not prescribe data sources and methods and evidence. Agencies may determine the specific methods of analysis and identify mitigations and alternatives through a similar process.
Assessment	Assessment in an EIS involves roughly the same process as assessment in HIA. This includes a description of the affected environment (baseline conditions), an analysis of environmental consequences of the decision alternatives, and recommendations for measures to protect health. A specific consideration in determining "significance" of an effect is "the degree to which the proposed action affects public health or safety" (40 CFR 1508.27).
Reporting	Assessment of health effects is reported within the Draft EIS (DEIS) either in subsections related to a category of environmental effect or in a public health, community health, or environmental justice subsection. The DEIS is subject to public comment, reassessed and revised based upon those comments, and released as a Final EIS (FEIS). Using the information in the FEIS, agency management renders a final "Record of Decision" approving, modifying, or rejecting the proposed action.
Monitoring	Typically, an EIS that includes required mitigation also includes a mitigation monitoring plan.

Seventeen state-level versions of NEPA are referenced on the NEPA website (http://www.nepa.gov/nepa/regs/states/states.cfm). Fourteen of these contain language that would support the inclusion of health effects analysis. For example, in California, the California Environmental Quality Act (CEQA) statute and guidelines includes human health impacts within the scope of potential adverse environmental impacts.[2] CEQA requires an Environmental Impact Report (EIR) to be prepared whenever the environmental effects of discretionary public decision has the potential significant adverse effects on human beings, either directly or indirectly (CCR §15065). CEQA regulations also specifically require that environmental impact

[2] Public Resources Code § 21000 of CEQA states that "the intent of the Legislature [is] that the government of the state take immediate steps to identify any critical thresholds for the health and safety of the people of the state and take all coordinated actions necessary to prevent such thresholds being reached." 14 Cal. Code Regulation §15065 states that a lead agency must find that a project may have a significant impact and require that an EIR be prepared if "…the environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly." 14 Cal. Code Regulation §15126.2 requires that the EIR discuss "health and safety problems caused by the physical changes."

reports (EIR) discuss "health and safety problems caused by the physical changes" (CCR §15126.2). In California, CEQA case law has consistently upheld the requirement to study public health impacts related to changes in environmental quality.[3]

Environmental effects considered in EIA can include damage to the health of biota, disruption of food webs; loss or transformation of habitats and natural areas; removal of natural resources; transformation of natural systems or landscapes; pollution of water, soil, or air, and change or development of the built environment. Diverse adverse effects on humans and human health can result indirectly from these environmental effects. Common indirect environmental effects on health or human welfare can include:

- Adverse health effects from a change in exposure or proximity to a new or existing environmental hazard, including air, water, or soil pollutants, noise, radiation, biological pathogens and injury hazards
- Reduction of the quality or quantity of recreational opportunities or access to or contact with natural areas;
- Prevention of culturally important uses of land and natural resources or damage to a culturally important, archaeological, paleontological, or architectural resource;
- Loss of natural resource or foreclosure of future use of natural resources for livelihood or sustainability (e.g., loss of a food, energy, or water resources);
- Change in the quality of housing
- Displacement or forced migration.

Despite statutory requirements, research on EIA practice shows that there is inconsistent and incomplete attention to health effects analysis in EIA practice (Arquiaga 1994; Cole 2004; Davies and Sadler 1997; Steinemann 2000; Wernham 2007). One review of 42 Federal EIAs conducted under NEPA found that more than half contained no mention of health; a minority contained narrow discussions of health risks (usually cancer risk assessments) associated with chemicals or radiation (Steinemann 2000). An international review demonstrated that EIA rarely considers health impacts mediated via changes in the built environment, social determinants, or economic impacts (Davies and Sadler 1997).

A number of institutional, organizational, and disciplinary factors may help explain the inattention to health within EIA (Bhatia & Wernham 2008; Rattle and Kwiatkowski 2003). For example, public health agencies may not be aware of EIA requirements or engage with the agencies responsible for these assessments. Health stakeholders have only infrequently used EIA to protect health interests and administrative or court challenges on inadequate health analyses are rare. Furthermore, health agencies appear to have few resources for cross-sector collaboration.

In the US, Federal agencies are becoming more attentive to the gaps in health analysis within NEPA. The Executive Order on Environmental Justice further established NEPA as a mechanism to ensure federal agencies analyze and mitigate disproportionately high health and

[3] For example: *Bakersfield Citizens for Local Control v. City of Bakersfield*, *Berkeley Keep Jets Over the Bay Committee vs. Board of Port Commissioners of the City of Oakland*, and *Californians for Alternatives to Toxics v. Department of Food and Agriculture.*

Actions to support integration of analysis of health effects within EIA:

- Apprise decision makers and responsible lead agency official of the requirements for health analysis under EIA statutes
- Identify health-relevant environmental effects, potential public health impacts, and population sensitivities
- Ensure public health agencies participate in the EIA process as participating or cooperating agencies
- Identify available data sources and research methods or provide lead agency officials with data and evidence on health impacts,
- Identify public health scientists or other experts to conduct research for EIA
- Apply analytic tools to study health impacts
- Develop health-based significance thresholds
- Identify mitigations and alternatives that would diminish adverse health impacts
- Ensure agencies with health expertise (such as local, regional, state, and tribal health agencies) are participating in the EIA process
- Review and critique environmental and health effects analysis in the EIA
- Conduct an HIA on the project subject to EIA
- Provide watchdog role for mitigation monitoring

environmental impacts.[4] The Presidential Memorandum that accompanied the Executive Order specified several specific mechanisms through which NEPA could support environmental justice by: identifying disproportionately high and adverse environmental and health effects of federal actions on minority and low-income communities; identifying measures to address such environmental and health impacts; providing opportunities for community input in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities (Clinton 1994). Both the CEQ and USEPA have issued guidance for preparation and review of NEPA documents with regards to cumulative impacts and environmental justice that address the requirements for health effects analysis (CEQ 1997; EPA 1998). In California, the USEPA has recommended conducting HIA in the course of maritime port expansion projects to achieve NEPA EJ requirements (USEPA 2008.)

NEPA does not require an HIA per se to occur as a separate and independent process from the process for producing an environmental impact statement (EIS). The EIS process under NEPA has several entry points for integrating health concerns and analysis. (See text box on this page); HIA may be one approach to assess health effects under NEPA.

The conduct of public health analysis in a NEPA-document would generally mirror the process used to analyze other environmental effects in an EIS. Health effects analysis could be documented as part of an EIS (e.g., a public health chapter) or as indirect effects of impacts on environmental resources (e.g., impacts on air quality or housing). Key outputs would include

- The baseline health status of affected communities, including both health status indicators, indicators of health resources, and indicators of conditions making the community vulnerable to health effects of the action.
- Analysis of the potential health consequences of the alternatives.

[4] Executive Order 12898 instructs Federal agencies to: make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.

- A discussion of disproportionate health effects on affect low income or minority populations (Executive Order 12898), or children (Executive Order 13045)[5].
- Identification of potential mitigation measures or alternatives to address any significant health effects.

NEPA, and the related state laws, have strong provisions for public input, with mandates for public comment periods during which impacted communities along with public agencies may submit input on the scope and adequacy of the EIA analysis. A lead agency must publish a notice when they intend to conduct an EIA; circulate a draft EIA for pubic review; and solicit comments on the draft. The lead agency must respond to all comments in writing, accounting for the input either by modifying the EIA or by justifying the original analysis. NEPA also mandates the responsible, or "lead," agency to solicit participation by state, local, and tribal governments and agencies with legal jurisdiction or relevant expertise (CEQ 1978 § 4331(a), §4332(2)).

Mitigating Impacts of National Petroleum Reserve Lease Sales, Alaska, 2007

Participating as a cooperating agency in the NEPA process, the Alaskan Intertribal Council conducted an HIA on proposed oil and gas leasing in the 4.6-million-acre Northeast National Petroleum Reserve, which lies within Alaska's 89,000-square-mile North Slope Borough. The Bureau of Land Management encouraged leases and permittees engaged in oil and gas exploration, development, and abandonment procedures in the planning area to work with the local communities to develop and implement measures to avoid or minimize the potential impacts. The Environmental Impact Statement included strategies to mitigate potential impacts on infectious disease transmission, sustenance resources, nutrition, and livelihoods based on strategies used in development experiences elsewhere in the world (Wernham 2007).

[5] Executive Order 13045 states that agencies must: make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and ... shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Mayor Andrea Rogers
Council President Tim Mortenson
Peny Wallace
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Dear Governor Kitzhaber and Directors Pederson, Solliday, and Garrett,

The Mosier City Council strongly opposes the proposed new coal export terminals which could result in an untenable increase in train traffic through our community and the exposure of our entire population and our environment to the harmful effects of coal dust. Calculations based only on the proposals that have been publicly announced reveal that mile long trains of open cars filled with coal could fill to capacity the railroad tracks that run through the heart of our community. Proposals have also been made to load coal on barges and ship the exposed coal down the Columbia River, the river which forms the City of Mosier's northern boundary.

The City of Mosier is located on the Columbia River in the heart of the Columbia River Gorge National Scenic Area. Tourists visiting this national treasure also visit Mosier because we offer excellent cycling roads through the natural scenic beauty of the Gorge and because the City of Mosier has invested heavily in a waterfront park that includes a windsurfing beach on the Columbia River.

Cherry orchards have historically formed the economic base of the Mosier Valley and are still the Mosier area's strongest industry. Vineyards have contributed recently to this strong agricultural presence. Within our city limits, Mosier relies more heavily on the tourist industry to sustain the businesses in our downtown core.

The proposals to traffic open train cars full of coal through the Columbia River Gorge could heavily impact every sector of the Mosier community. These proposals represent a change in the usage of the rail lines that is unprecedented.

The Union Pacific Railroad runs alongside the City of Mosier's downtown commercial zone, through our Waterfront Park, and through our residential areas. Every residence and business in Mosier is exposed to the railroad by a very close proximity. Mosier Community School children play in the schoolyard located less than 100 yards from the railroad tracks. Our restaurants and our market are located less than 100 yards from the railroad tracks. The historic Mosier Fruit Growers building, where cherries are packed every summer for export, is located less than 30 yards from the railroad tracks. One of our new residential developments, the Mosier Creek Condos, is located less than 30 yards from the railroad tracks and our largest subdivisions are directly exposed to the railroad tracks by sight and sound. Some of the Mosier Valley's orchards border the railroad tracks.

Because our residences and our school are so exposed to the railroad tracks, The Mosier City Council is gravely concerned about the impact of coal dust on the health of our community members, especially our children.

And because coal dust escaping from the open train cars could pollute our air, our river, and our orchards, we are concerned that coal train traffic will damage our economic bases of agriculture and tourism.

If coal trains are allowed to dominate our community, they could stunt if not crush the success of our developing downtown.

Yet these coal export terminal proposals are moving forward without any opportunity for public debate. Negotiations are occurring literally behind closed doors. The City of Mosier and other Columbia Gorge communities that could be seriously impacted by the proposed coal export terminals have not been invited to participate in any form of information gathering or decision making.

The Mosier City Council expects Governor Kitzhaber and our Oregon state agencies to respond to our concerns with the following:

1. Require an analysis of public health impacts of coal dust as would be relevant to the communities in the Columbia River Gorge.
2. Require an analysis of the economic impact of coal train traffic on Oregon communities (health care, businesses, property values, downtown development, agriculture, etc).
3. Require an analysis of the environmental impacts of coal train traffic on air quality, surface and/or ground water, and agriculture within 7 miles of the railroad tracks.
4. Ensure that all information is public.
5. Hold informational hearings in affected communities and in the Columbia River Gorge in order to share information and hear concerns from citizens. These hearings should include the governor, his staff, and the directors of state agencies.
6. The governor should direct the agencies to carefully scrutinize any permits and consult with him prior to any approvals for permits associated with coal export.
7. Require an analysis of the cost of the environmental devastation a coal train derailment would have on the communities in the Columbia River Gorge.
8. Require coal companies to avoid adversely affecting communities like Mosier or compensate these communities for the negative health, environmental, and economic impacts resulting from coal exports and the associated traffic by rail or barge.

Thank you for your attention to this issue which could have such a strong negative impact on our community. We request that you inform the City of Mosier in a timely manner of any updates regarding the proposed new coal export terminals.

Sincerely,

Andrea Rogers, Mayor
Mosier City Council
City of Mosier

August 24, 2015

Governor Kate Brown
State Capitol Building
900 Court Street NE, 160
Salem, Oregon 97301

Governor Brown,

The Oregon Nurses Association (ONA) applauds your work to promote a clean, healthy environment for all Oregonians.

As you know, ONA believes Oregon must reduce our use of coal and other pollutants at home and continue working to decrease the use of nonrenewable energy sources worldwide; including opposing projects that would increase coal transportation and use in Oregon.

The negative effects of coal and other pollutants go far beyond environmental concerns. Exposure to high concentrations of coal and coal particulate matter has been linked to multiple health problems, including heart attacks, strokes, asthma and pneumoconiosis. In addition, coal transportation leads to harmful emissions and can delay local emergency responders.

As frontline members of our health care system, nurses are concerned about the negative health and environmental impacts caused by coal and other pollutants and strongly recommend Oregon reduces our dependence on nonrenewable fuel sources and works to grow a clean energy economy that promotes local jobs and improves public and environmental health.

Together, we can set a new energy standard and improve Oregonians' health and our environment.

Thank you for your ongoing support and leadership on this issue.

Sincerely,

Susan E. King

Susan E. King, MS, RN, CEN, FAAN
Executive Director
Oregon Nurses Association

cc: Brian Shipley, Chief of Staff, Office of the Governor
Margi Hoffman, Energy Policy Advisor, Office of the Governor
Elana Pirtle-Guiney, Labor and Workforce Advisor, Office of the Governor

18765 SW Boones Ferry Road, Suite 200 · Tualatin, OR 97062 · Phone: 503-293-0011 · Fax: 503-293-0013

Oregon Nurses Association
Voice of Oregon Nurses Since 1904

Governor John Kitzhaber
160 State Capitol
900 Court Street
Salem, Oregon 97301-4047

Governor Kitzhaber,

The Oregon Nurses Association (ONA) applauds your recent announcement to “once and for all say no to coal exports from the Pacific Northwest.”

ONA fully supports your position and asks you to continue your work with state and regional leaders to ensure that coal is not transported through Oregon or along waterways adjacent to Oregon.

As you know, exposure to coal and coal particulate matter in high concentrations has been linked to multiple health problems, including heart attacks, strokes, asthma and pneumoconiosis. In addition, coal transportation can lead to harmful emissions and delay emergency responders.

As frontline members of our health care system, nurses share your concern about the negative health and environmental impacts increased coal transportation may cause.

At our convention earlier this month, ONA members from across the state overwhelmingly passed a resolution to support your recent statements about coal exports and ask you to do everything within your authority to stop coal transportation projects.

We believe coal transportation and exports are not in Oregonians’ best interests and ask you to use all available authority and resources to deny any coal export permit applications submitted to Oregon agencies.

By denying coal exports from Oregon and the Pacific Northwest, our region sets a positive standard for others to follow and takes an important step to ensure that our energy, health and economic policies truly benefit the people who live here.

Thank you for your support.

Sincerely,

Susan E. King

Susan E. King, MS, RN, CEN, FAAN
Executive Director
Oregon Nurses Association

cc: The Honorable John M. McHugh, Secretary of the Army
Department of State Lands Director Mary Abrams
Department of Environmental Quality Director Dick Pedersen
Energy Policy Advisor Margi Hoffman

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Email: ona@oregonrn.org · Web: www.OregonRN.org

ONA is an affiliate of the American Nurses Association, National Federation of Nurses, AFT and AFL-CIO

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.**

Summary

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 <u>cumulatively</u>? 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)

Health Impacts of Noise: Sleep Disturbance:

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)

Health Impacts of Noise: Mental Health:

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.

Health Impacts of Rail Crossings: EMS Delays

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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Thank you for your consideration of these comments.

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November 18, 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 (MBTL)

To Whom It May Concern:

Thank you for the opportunity to comment on the proposed Millennium Bulk Terminals Longview (MBTL) project. This is the second of two formal comment letters Oregon Physicians for Social Responsibility (0regon PSR) will submit during the scoping process.

Oregon Physicians for Social Responsibility, guided by the values and expertise of medicine and public health, works to protect human life from the gravest threats to health and survival by striving to end the nuclear threat, advance environmental health and promote peace.

We are opposed to the MBTL project based on our interpretation of the Precautionary Principle. According to the Toxics Reduction Strategy of the City of Portland and Multnomah County (April 2006), “the Precautionary Principle is a paradigm that suggests taking precautionary measures when an activity raises threats of serious or irreversible harm, even if some of the cause-and-effect relationships

are not fully established (UN, 1992; Wingspread, 1998). Such a precautionary approach involves several key components: establishing goals, seeking out and evaluating alternatives, community right-to-know reporting, full cost accounting, and developing more participatory and transparent decision-making methods." We believe that multiple activities associated with the proposed MBLT raise serious threats of serious and irreversible harm, even if some of the cause-and-effect relationships are not fully established.

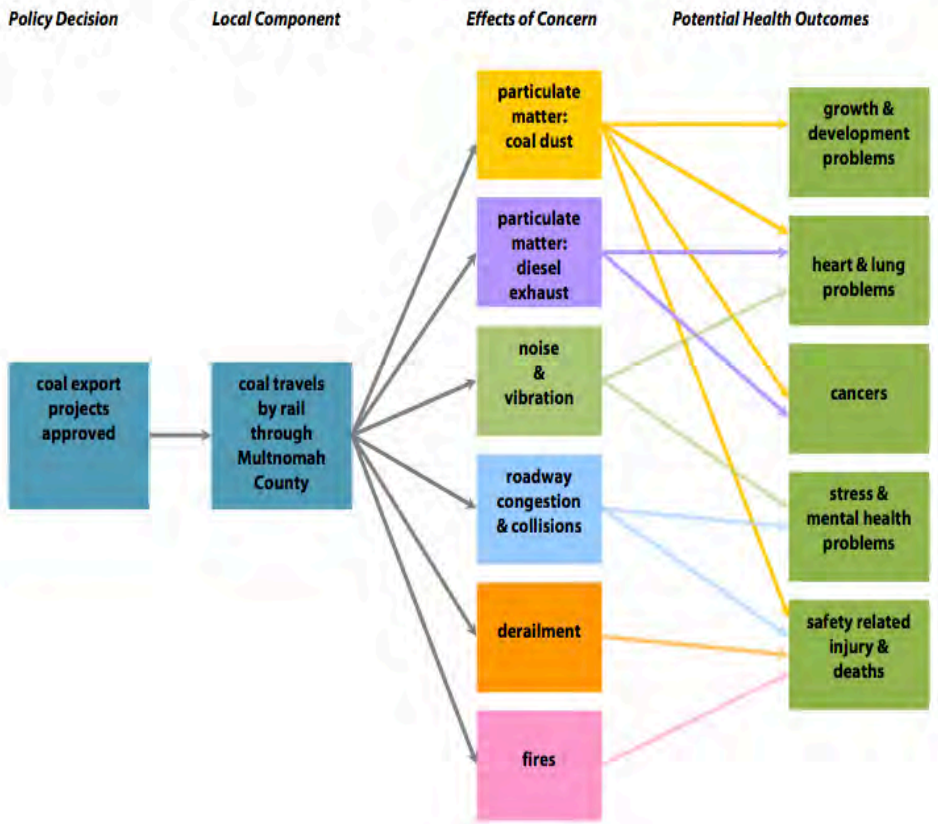
Need for Region-Wide EIS and HIA(s)

If co-lead agencies are not prepared to deny the application based on the Precautionary Principle or for other reasons, including the harmful impacts that MBTL could have on sovereign nations and their treaty-reserved rights and resources, Oregon PSR holds that it is the legal and moral responsibility of co-lead agencies to perform a programmatic, regional Environmental Impact Statement (EIS), a regional Health Impact Assessment (HIA), and a site-specific HIA that examines cumulative impacts – direct and indirect – of MBLT. The regional HIA should include a public scoping process involving all communities affected by mining, transportation and combustion of the coal proposed for MBTL.

The image below, which describes only the relationship between policy decisions related to the transportation of coal and potential health outcomes, demonstrates the many complex relationships which must be identified and reviewed in these HIAs. Note that "this figure does not reflect the possible cumulative or synergistic impacts of these health outcomes on individual and community-based health." Indeed, a comprehensive HIA for the proposed MBTL should include possible cumulative or synergistic impacts of these health outcomes on individual and community-based health.

unnamed document (1 page)

Figure 1: *Relationships between coal transportation by rail, environmental effects of concern, and health outcomes*



This figure does not reflect the possible cumulative or synergistic impacts of these health outcomes on individual and community-level health.

Cancel Print

Values of an HIA

We request the incorporation of values, as described below, into a regional HIA and a site-specific HIA for MBTL.

The Values of Health Impact Assessment

From the International Association of Impact Assessment (Quigley, 2006)

Democracy – emphasizing the right of people to participate in the formulation and decisions of proposals that affect their life, both directly and through elected decision makers. In adhering to this value, the HIA method should involve and engage the public, and inform and influence decision makers. A distinction should be made between those who take risks voluntarily and those who are exposed to risks involuntarily (World Health Organization, 2001).

Equity – emphasizing the desire to reduce inequity that results from avoidable differences in the health determinants and/or health status within and between different population groups. In adhering to this value, HIA should consider the distribution of health impacts across the population, paying specific attention to vulnerable groups and recommend ways to improve the proposed development for affected groups.

Sustainable development – emphasizing that development meets the needs of the present generation without compromising the ability of future generations to meet their own needs. In adhering to this value, the HIA method should judge short- and long-term impacts of a proposal and provide those judgments within a time frame to inform decision makers. Good health is the basis of resilience in the human communities that support development.

Ethical use of evidence – emphasizing that transparent and rigorous processes are used to synthesize and interpret the evidence, that the best available evidence from different disciplines and methodologies is utilized, that all evidence is valued, and that recommendations are developed impartially. In adhering to this value, the HIA method should use evidence to judge impacts and inform recommendations; it should not set out to support or refute any proposal, and it should be rigorous and transparent.

Comprehensive approach to health – emphasizing that physical, mental, and social well-being is determined by a broad range of factors from all sectors of society (known as the wider determinants of health). In adhering to this value, the HIA method should be guided by the wider determinants of health.

Independent HIA Team

We understand that an independent, collaborative group from WSU, Oregon Public Health Institute and UW has commenced work on an HIA related to coal export facilities in the Pacific NW. We ask that you share with them (and the public) the scope of your HIA work once that has been determined and then incorporate their data and analyses into the draft EIS for MBTL.

Environmental Justice

We request that you perform HIA(s) that thoroughly examine how the mining, transportation and combustion of coal from MBTL could exacerbate the already disproportionate environmental burdens and health inequities experienced by environmental justice communities.

Coal Pollutants - General

Coal is the most toxic fossil fuel on this planet. Physicians for Social Responsibility found in 2009 that coal pollutants affect all major body organ systems and contribute to four of the five leading causes of mortality in the U.S.: heart disease, cancer, stroke, and lower respiratory disease.

Coal is described by Alan Lockwood, MD, as one of the 10 top killers in the United States. He has stated, “We will not find ‘exposure to burning coal’ listed as the cause of death on a single death certificate, but tens of thousands of deaths from asthma, chronic obstructive pulmonary disease, lung cancer, heart attacks, strokes, and other illnesses are clearly linked to coal-derived pollution.”

Please include in an HIA a review of the peer-reviewed literature cited in *The Silent Epidemic: Coal and the Hidden Threat to Health* by Dr. Alan Lockwood.

Outdoor Air Pollution and Particulate Matter

Please review and consider in a HIA this new information provided by the World Health Organization described in this press release (http://www.iarc.fr/en/media-centre/pr/2013/pdfs/pr221_E.pdf) and in the related article below:

The carcinogenicity of outdoor air pollution

Dana Loomis [a], Yann Grosse [a], Béatrice Lauby-Secretan [a], Fatiha El Ghissassi [a], Véronique Bouvard [a], Lamia Benbrahim-Tallaa [a],Neela Guha [a], Robert Baan [a], Heidi Mattock [a], Kurt Straif [a], on behalf of the International Agency for Research on Cancer Monograph Working Group IARC, Lyon, France

In October, 2013, 24 experts from 11 countries met at the International Agency for Research on Cancer (IARC), Lyon, France, to assess the carcinogenicity of outdoor air pollution. This assessment was the last in a series that began with specific combustion products and sources of air pollution and concluded with the complex mixture that contains all of them. The results of this most recent assessment will be published as volume 109 of the IARC Monographs.[1]

Outdoor air pollution is a mixture of multiple pollutants originating from a myriad of natural and anthropogenic sources. Transport, power generation, industrial activity, biomass burning, and domestic heating and cooking are the predominant anthropogenic sources in many locations.[2] The mix of pollutants in outdoor air varies substantially over space and time, showing not only the diversity of sources, but the effect of atmospheric processes, including oxidation and weather. Diverse approaches are used to measure air pollution and some countries have established monitoring networks that typically record levels of regulated pollutants, such as respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2\cdot5}$), NO_2, SO_2, and O_3. $PM_{2\cdot5}$ is increasingly used as an indicator pollutant, with annual average concentrations ranging from less than 10 to more than 100 μg/m^{3}globally. Pollution levels in western Europe and North America have generally declined since the late 20th century, but they are increasing in some rapidly industrialising countries, notably in Asia. In many areas, WHO and national air quality guidelines for $PM_{2\cdot5}$ and other pollutants are routinely and substantially exceeded.[3] Occupational exposures to outdoor air pollution, although not routinely monitored, are also of concern for certain groups of workers, such as traffic police, drivers, and street vendors.

The IARC Working Group unanimously classified outdoor air pollution and particulate matter from outdoor air pollution as carcinogenic to humans (IARC Group 1), based on sufficient evidence of carcinogenicity in humans and experimental animals and strong mechanistic evidence.

The findings regarding the carcinogenicity of outdoor air pollution as a mixture, and of particulate matter specifically, are remarkably consistent in epidemiological research, studies of cancer in experimental animals, and a wide range of studies of mechanisms related to cancer. Particularly, an increased risk of lung cancer was consistently observed in cohort and case-control studies including millions of people and many thousands of lung cancer cases from Europe, North America, and Asia. The largest and most informative studies were a pooled analysis of data from ten European countries and a large nationwide cohort study in the USA.[4], [5] Many studies estimated quantitative levels of outdoor air pollutants, most often as mass concentration of particulate matter, and adjusted for a wide range of potential confounders including tobacco smoking. Increased risk associated with outdoor air pollution was also seen in studies restricted to never smokers.[6] Positive exposure-response relations were consistently observed in studies that provided such data. Notably, virtually all of the studies were done in areas where annual average levels of $PM_{2\cdot5}$ range from about 10 to 30 μg/m^3, which represents approximately the lower third of exposures worldwide. Nevertheless, increased risk of lung cancer was observed even in those areas where $PM_{2\cdot5}$ concentrations are less than the current health-based guidelines.[4]

There was limited epidemiological evidence for bladder cancer associated with various metrics of exposure to outdoor air pollution, including occupational and residential exposure to traffic or traffic emissions, in studies that were adjusted for tobacco smoking. However, most studies assessed exposure only by employment in occupations with potentially high exposure to outdoor air pollution, so the results did not weigh heavily in the evaluation.

The Working Group also reviewed evidence regarding the carcinogenicity of outdoor air pollution in experimental animals. As part of this process, the IARC's earlier evaluations of diesel engine exhaust and of emissions from the combustion of coal and wood were updated and confirmed. All of these agents can be present in outdoor air and were shown previously to cause benign and malignant lung tumours in mice or rats.

Only a few studies have assessed the occurrence of cancer in animals exposed directly to outdoor air pollution by inhalation. Studies of mice exposed to traffic-related outdoor air pollution in São Paulo, Brazil, showed an increase in the incidence of lung adenoma, and an increase in the incidence and tumour multiplicity of urethane-induced adenomas in a dose-dependent manner.[7]Several studies in which mice were injected

subcutaneously with organic solvent-extracted material from particles collected from outdoor air pollution, showed increased incidence of injection-site tumours, including fibrosarcomas, and pulmonary adenoma or adenocarcinoma.[8], [9]

The findings of carcinogenicity in humans and animals are strongly supported by a large, diverse body of evidence showing genetic and related effects in exposed humans and animals and a wide range of experimental systems. Studies of people exposed occupationally to outdoor air pollution have shown enhanced frequencies, relative to controls, of chromosome aberrations and micronuclei in lymphocytes.[10], [11] Exposure to polluted outdoor air in occupational settings or urban and industrial areas is also associated with changes in the expression of genes involved in DNA damage and repair, inflammation, immune and oxidative stress response, as well as altered telomere length and epigenetic effects such as DNA methylation.[11] An increase of cytogenetic and DNA damage related to outdoor air pollution was associated with genetic polymorphisms, such as *GSTM1* null. Genetic damage, including somatic and germ-cell mutations, cytogenetic abnormalities, and DNA damage were also observed in mammals, birds, and plants exposed to outdoor air pollution.[12] Genotoxic effects have also been observed in studies of human and animal cell lines in vitro.

Additionally, extracts of particulate matter from outdoor air representing a wide range of locations, time periods, and atmospheric conditions induce mutations in bacteria. This mutagenic activity, covering more than five orders of magnitude per volume of air across locations, is quantitatively related to the concentration of atmospheric particulate matter. Thus, the Working Group concluded that there is strong evidence that real-world exposures to outdoor air pollution, in several species, are associated with increases in genetic damage, including cytogenetic abnormalities, mutations in both somatic and germ cells, and altered gene expression, which have been linked to increased cancer risk in humans.

The Lancet Oncology, Early Online Publication, 24 October 2013

Diesel Particulate Matter (DPM)

We believe there is ample evidence to connect components of DPM with adverse health effects in children and in reproductive aged women, including asthma and behavioral problems in children and reproductive problems and premature births in young women. We encourage you to consult with Dr. Susan Katz of Oregon PSR if you

do not have access to this peer-reviewed literature which should be reviewed as part of an HIA for MBTL.

Mercury

Mercury is a potent neurotoxin. We request that the co-lead agencies tap the expertise of the Washington Department of Health and other entities with great knowledge of the distribution and impacts of mercury pollution. Other resources we recommend are listed below.

The Centers for Disease Control and Prevention (CDC) reports 1 in 88 American children aged 8 years is now affected by an Autism Spectrum Disorder (ASD) (March 30, 2012, from surveillance year 2008). The prevalence of ASD in surveillance year 2002 was 1 in 150. A recent study released by the CDC reported 9.5% of U.S. children (aged 4-17 years) in 2007 had an Attention Deficit Hyperactivity Disorder (ADHD), per a parent report survey, representing a 22% increase from a parent report survey four years previously, in 2003, indicating 7.8% of children aged 4-17 years with ADHD (www.cdc.gov/Features/dsADHD/). A study "Trends in the Prevalence of Developmental Disabilities in U.S. Children, 1997-2008" revealed 7.66% of U.S. children had a learning disability during that time period, with a 5.5% increase in learning disabilities between the periods 1997-1999 and 2006-2008 (www.cdc.gov/Features/dsDev_Disabilities/). Further statistics from the CDC reveal that, for U.S. children aged 12-17 years in 2010, 9.3% have a learning disability and 11.6% have an Attention Deficit Hyperactivity Disorder (Dec. 2011). The rate of increase for this age group from previous years was not available.

National Institutes of Health (NIH) Journal Articles Linking Diesel Exhaust to Neurodevelopmental disorders:

Autism: http://ehp.niehs.nih.gov/1206187/

Brain Development: http://ehp.niehs.nih.gov/1306528/

ADHD http://ehp.niehs.nih.gov/1205555/

Learning Difficulty: http://ehp.niehs.nih.gov/1205940/

American College of Obstetrics and Gynecology and American Society for Reproductive Medicine,
Committee Opinion, Number 575, October 2013, www.acog.org

Articles about mercury (in coal dust) and neurodevelopment:

Cheuk, D., Wong, V., “Attention-Deficit Hyperactivity Disorder and blood mercury level: a case-control study in Chinese children, *Neuropediatrics* 2006: 37:234-240

Chen, C., "Methylmercury effects and exposures: Who is at risk?", *Environmental Health Perspectives (EHP)*, 2012, 120(6)

Grandjean, P., et al, “The Faroes Statement: Human health effects of developmental exposure to chemicals in our environment,” *Basic and Clinical Pharmacology and Toxicology*; 2007, 10.1111; 1742, p 1-3

Karagas, M. et al, “Evidence on the human health effects of low-level methylmercury exposure,” *Environmental Health Perspectives (EHP)*, 2012; 120(6); 799-806

Miodovnik, A., “Environmental neurotoxicants and developing brain,” *Mt. Sinai Journal of Medicine* 2011, 78: 58-77

Landrigan, P., “A research strategy to discover the environmental causes of autism and neurodevelopmental disabilities (NDD),” *EHP*, 2012, 120(7)

Mahaffey, K., et al, “Adult women’s blood mercury concentrations vary regionally in the United States: association with patterns of fish consumption (NHANES 1999-2004),” *EHP* 2009; 117:47-53.

National Scientific Council on the Developing Child (www.developingchild.net), “Early exposure to toxic substances damages brain architecture,” Working Paper #4, Spring, 2006

Sexton et al, "Biomarker measurements of concurrent exposure to multiple environmental chemicals and chemical classes in children," *J of Toxicology and Environmental Health*, 2011, Part A, 74:927-942

Windham, G. et al, “Autism Spectrum Disorders in relation to distribution of hazardous air pollutants in the San Francisco Area,” *EHP*, 2006, 114(9); 1438-1444

Drinking Water

Residents of Longview, WA. commenced drinking ground water in January of 2013. Their water source, and a treatment facility, is located near the proposed coal export facility, where coal will be exposed and stored outside on the ground.

What is the relationship between the hydrology/geology of the drinking water aquifer and the storage site?

What is the risk to drinking water from diesel emissions and potential spills at the terminal? At the dock(s)?

What is the relationship between surface water and groundwater that may be impacted by the MBTL facility and its operation 350 days per year?

Does the Columbia River communicate with ground water supplies that are the source of Longview's drinking water?

Should the existing source of water become contaminated, what is the back-up water supply for Longview?

Should the existing source of water become contaminated, how much will it cost to develop an alternative source of drinking water for residents of Longview? Who will pay?

Are alternative sources limited by the need for large amounts of water to reduce coal dust and decrease fire risk of enormous piles of coal?

What is the potential damage to multiple drinking water sources all along the transportation route associated with MBTL?

Noise

Please examine the relationship between noise generated by 8- 16 coal trains per day and hearing loss. What are potential impacts? Where will impacts be experienced? Who is most likely to suffer? What will the costs be? Who will bear these costs?

Climate Change

Many physicians, health professionals and public health advocates believe that climate change is a public health emergency and the largest threat to human health in this century.

Organizations calling for prompt reduction in carbon dioxide pollution include the American Medical Association, American Nurses Association, American Academy of Pediatrics, American Public Health Association, American Academy of Family Practitioners,

American Thoracic Society, American Lung Association, National Academy of Sciences, US Centers for Disease Control and Prevention, American Lung Association, World Health Organization, and Physicians for Social Responsibility.

The burning of coal handled by proposed NW export facilities alone could generate more than 200 million metric tons of carbon pollution each year.

Approval of this project and combined projects in the Pacific NW would exacerbate climate chaos with more extreme weather events and significant changes in hydrological cycles. Those changes can lead to grave health impacts ranging from disease and dislocation, loss of access to medication, and an increased incidence of disease, to starvation and even war.

Please identify the potential health impacts of climate change exacerbated by the mining, transportation and combustion of this coal. How will those impacts distributed? Which populations are most vulnerable? Who will bear the cost? Who will pay with their health, safety and sense of well-being?

Finally, we request that you incorporate by reference the following documents and/or comments:

- "Potential Health Impacts of Millennium Bulk Terminals Longview (MBTL) / Physicians Request a Comprehensive Health Impact Assessment (HIA) Be Included in the EIS. "

  Please note that this comment was submitted by Oregon PSR on November 17, 2013 is supported by 158 Oregon and Washington physicians who voice concerns, and not opposition to, MBTL in the context of this document.

- "Washington Health Community Position Statement on Proposed Coal Exports"

  Please note that this comment is supported by 54 concerned SW Washington health professionals.

- Statement of The Yakama Nation (November 18, 2013)

- Comments of The Yakama Nation (November 18, 2013)
- Statement of The Cowlitz Indian Tribe (September 9, 2013)
- Comments of Dr. Lee Ann Gekas (September 17, 2013)
- Comments of Dr. Maye Thompson (September 17, 2013)
- Comments of Dr. Theodora Tsongas (October 9, 2013)
- Comments of Margie Kircher, MS OTR (October 9, 2013)
- Comments of Diane Winn, RN (October 9, 2013)
- Comments of Alona Steinke, RN (October 9, 2013)
- Comments of Marilee Dea, RN (September 17, 2013)
- Comments of Dr. Andrea Voss-Andreaes (October 9, 2013)
- Comments of Dr. Patrick O'Herron (October 9, 2013)
- Comments of Dr. Martha Neuringer (October 9, 2013)
- Comments of Dr. Andy Harris (November 18, 2013)
- Comments of City of Milwaukie, Oregon (November 18, 2013)
- Comments of the City of Mosier, Oregon (November 18, 2013)
- Comments of the Mayor Kitty Piercy of Eugene, Oregon (November 8, 2013)
- Portland City Council Resolution 3659 (September 19, 2012)
- Portland City Council Resolution 36962 (October 4, 2012)
- Resolution of the City Council of the City of Beaverton 4182 (June 18, 2013)
- Resolution of the Metro Council No. 12-4367A (September 20, 2012)
- Comments of The Mazamas (November 18, 2013)
- Comments of Earthjustice submitted on behalf of Oregon Physicians for Social Responsibility and others. (November 16, 2013)

Thank you for consideration of these comments,

Regna Merritt

Oregon Physicians for Social Responsibility

812 SW Washington Street, Suite 1050

Portland, Oregon 97205

Position Statement on Coal Exports from
Concerned Oregon Physicians to Governor Kitzhaber

Multinational coal companies propose to send coal mined in the Powder River Basin by rail and barge through the Pacific Northwest to be loaded onto large ships and exported to Asia. If current proposals are approved, that could result in more than 150 million tons of coal shipped each year. An average of 26 loaded coal trains, each one-mile long (or longer) with over 100 cars propelled by four diesel engines, could pass through Oregon and/or Washington every day. This will result in the release of significant amounts of airborne pollutants and related disease from diesel engines and coal dust. The increased train traffic will also cause significant delays at many rail crossings, increased risk of vehicle and pedestrian injuries along the tracks, and increased noise pollution. As a group of Oregon physicians, we are deeply concerned about the health and safety impacts these proposals.

A group of Washington physicians has carefully reviewed data published in peer-reviewed medical journals which show that:

Diesel particulate matter is associated with: (See *Appendix A*, *Appendix C)*

- impaired pulmonary development in adolescents;
- increased cardiopulmonary mortality and all-cause mortality;
- measurable pulmonary inflammation;
- increased severity and frequency of asthma attacks, ER visits, and hospital admissions in children;
- increased rates of myocardial infarction (heart attack) in adults; and
- increased risk of ischemic stroke.

Coal dust is associated with: (See *Appendix B*)

- chronic bronchitis;
- emphysema;
- pulmonary fibrosis (pneumoconiosis); and
- environmental contamination through the leaching of toxic heavy metals.

Noise exposure causes: (See *Appendix D*)

- cardiovascular disease, including increased blood pressure, arrhythmia,
- stroke, and ischemic heart disease;
- cognitive impairment in children;
- sleep disturbance and resultant fatigue, hypertension, arrhythmia, and increased rate of accidents and injuries; and
- exacerbation of mental health disorders such as depression, stress and anxiety, and psychosis.

Frequent long trains at rail crossings will mean: (See *Appendix E*)

- delayed emergency medical service response times; and
- increased accidents, traumatic injury and death.

More recent research published in major medical journals augments prior concerns including, but not limited to: (See *Appendix F*)

- increased risk of lung cancer.

Additionally, several recent studies have shown that powerful spring trade **winds can carry Asian pollution into the atmosphere above North America.** Some of the imported pollution descends to the surface, where it affects ground-level concentrations of ozone, mercury, sulfur compounds and soot. Ground-level ozone can cause severe respiratory problems, including asthma, in susceptible individuals.

A 2008 study (see *Appendix G*) found that Asian emissions of mercury contribute 18% of springtime mercury concentrations at Mount Bachelor. Snowpack runoff ends up in our rivers and lakes where the mercury contaminates the fish we eat. Pregnant women and children are particularly vulnerable to the toxic effects of mercury. Mercury is a potent neurotoxin that can damage developing brains in fetuses and children.

The effects of air pollution are not hypothetical, but real and measurable. Many of the reviewed studies 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."

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

As physicians, we believe the risks to human health from massive coal shipments across our state, down the Columbia River, and through our communities are significant. We are particularly concerned with the health of our most vulnerable populations: prenatal, early childhood, the elderly and those with pre-existing conditions. We must identify likely exposures for affected workers and individuals all along the line, from the mines to the trains, to the barges, and to the ports of the Northwest. We want to prevent new sources of morbidity and mortality. We seek your help in doing so.

Specifically, we request that you call for and examine both a comprehensive Health Impact Assessment (to include cumulative effects) and a programmatic Environmental Impact Statement before any coal export facility, infrastructure or related transport is approved by any Oregon state agency.

With respect,

Partial list of public health/safety questions for Millennium Bulk Terminals Longview (MBTL) DEIS comment

Because of the health impacts that will be a direct result of the MBT project, we respectfully request that the Final EIS include a Health Impact Assessment that addresses the following questions and includes a public comment process.

I. Health Impacts of Diesel Particulate Matter (DPM)

1. How much DPM and toxins 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 will result from the ships, including ships that are at anchor (staging), at the dock, and 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 transportation routes from the Powder River Basin and the Uinta Basin to Longview, from there to the mouth of the Columbia River, from Longview back to the Powder River Basin via Stampede Pass, and from Longview back to the Uinta Basin via Oregon, 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? Neurodevelopmental disorders? 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?

15. How many people in Cowlitz County, in Longview and in the Highlands neighborhood have pediatric asthma, adult asthma, COPD, cardiovascular disease, diabetes, are under 18 or over 65 years of age, and/or live in poverty?

II. Health Impacts of Coal Dust

1. How much coal dust from the mining and transportation of coal can be expected along each section of the transportation corridors from the Powder River Basin and Uinta 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 or 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 farmland 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 and the Uinta 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

1. How loud are train engines? Squeaking wheels? Horn blasts? Federal regulations require that the horns sound at levels of 96 to 110 dBA measured at 100 feet for 15 to 20 seconds in advance of all public grade crossings. How loud are horn blasts 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 at-grade crossings are there? How many horn blasts per crossing? How many horn 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, Pasco, Camas, Hood River, Portland 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

1. How many rail crossings are there along potential rail corridors from the Powder River Basin and the Unita Basin to Longview and back to the Powder River Basin and Unita Basin? How many of these are at-grade crossings? Why did you only select 44 at-grade crossings

in the state of Washington to review?

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 each of 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 often 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 often 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 throughout the entire state of Washington?

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.?) What percent of the total cost will the project applicant pay for grade separation at crossings, 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 the lifetime of the project?

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?

V. Health Impacts to Drinking Water

1. Does the Wellhead Protection Program (WHPP area) for the City of Longview's Mint Farm Wellfield encompass the project area? Does the project lie within and above the 6-month WHPP Source area? The 1-year WHPP Source Area? The 5-Year WHPP Source area? The 10-year WHPP Source Area? Does water from those Source Areas flow beneath the project area en route to city wells?

2. What impact will pre-operation wicking and compression have on the movement of surface water? On the movement of legacy pollutants like benzene and arsenic? Can that ultimately impact the quality of groundwater?

2. What is the relationship of the unconfined aquifer to the deep aquifer depicted in the technical reports? What is the relationship to the drinking water source?

3. What is the tidal influence on the Columbia River at the project area and how will that affect movement of waterborne pollutants discharged at the project site?

4. What will be the influence of MBTL's heavy pumping of private wells during the dry season (for purposes of dust suppression) on City of Longview wells?

5. What contaminants and pollutants can be expected to flow into to the Columbia River as treated wastewater, untreated surface water or overflow from storms? Diesel pollution, toxic coal dust, fuel spills? Abestos, lead and arsenic from demolition projects ? Leaks and spills from associated barges, tugs, Panamax-class and Handymax-class vessels?

6. What is the transit time from the Columbia River to the deep aquifer that serves as the drinking water source for residents of Longview?

6. Who will pay if the drinking water source for the City of Longview is contaminated with pollutants as a result of this project and must be permanently replaced? What is the cost of temporary purchase or replacement of drinking water for residents?

7. Will you identify by name and location all domestic and municipal water systems that could be harmed with a derailment and spill of coal trains and/or coal vessel fire and fuel spill. How many people are served by those systems? Who will pay for monitoring and cleanup when and if other municipal drinking water sources are fouled in Washington? In Oregon? In Idaho? In Montana?

VI. Environmental Justice Impacts

1. What will be the cost to culture, tradition and food sources for First Nations if mercury accumulate in water (from blow-back from coal-fired power plants in Asia) and result in harm to salmon?

2. What are the impacts of mercury neurotoxicity and who is most likely to suffer?

3. What will be the impacts to traditional culture and foods if this project leads to a decrease in the number of salmon and other fish available for harvest?

4. Whose access to tribal treaty fishing sites will be lost, made more difficult or result in injury because of the increasing number of long unit trains on the UP and BNSF lines?

5. Will you analyze all census tracts running 2 miles along all rail corridors, all vessel corridors, including rail and vessel corridors in Cowlitz County and in Longview, for health impacts from this project that may be experienced by

communities of color and low income communities, children under 18, adults 65 and over, and individuals with pre-existing disease including pediatric asthma, adult asthma, COPD, cardiovascular disease, and diabetes?

VI. Health Impacts of Climate Change

1. What will be the human health impacts to climate change under a scenario with MBTL activities resulting in 27 million metric tons/year net CO2 emissions (see Greenhouse Gas Appendix Table 47)? With 3.2 million metric tons/year? With 37.6 million metric tons of Co2 emitted between 2018 and 2038?

What could be the impact on Cowlitz County and Washington residents and fire fighters from forest fires, smoke, injury, death and dislocation?

What are the impacts from increased heat, increased ozone levels and degraded air quality? How will this impact pediatric populations? Adults over 65? Those with pre-existing disease like asthma, bronchitis, COPD? Who will most suffer? Who will pay?

What will be the health impacts of severe weather, including heavy rain, wind storms and landslides that lead to dislocation, injury and death? Who will pay?

What will be the impacts from increasing rates West Nile Virus and Lymes disease in Cowlitz County? In Washington? Who will pay?

Will there be disproportionate and adverse effects on low income communities and communities of color? If so, what will they be?

Health Impacts of Surfactants

Which chemical surfactants will be used? Which chemicals will be applied by workers, deposited along the transportation corridors and in communities around the coal pile, from blowing dust and leaching by rainwater. What are the human and environmental impacts of exposures? Have chemical compounds such as GE Powertreat, designed for use on Powder River Coal (and known to be a serious skin, eye and lung irritant), been tested for chronic toxicity? Have these compounds been tested for longer term human and environmental health impacts?

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November 18, 2013

US Army Corps of Engineers
Washington Department of Ecology
Cowlitz County Commission

Address:
comments@millenniumbulkeiswa.gov

Subject: Docket number 2013-19738: Comment on scope of EIS for Millennium Bulk Terminals Longview LLC Coal Export Terminal

Ladies and Gentlemen:

We thank you for this opportunity to make comments on the scope of the Environmental Impact Statement for the proposed Millennium Bulk Terminals.

The Mazamas

Mazamas is a 3,400 member non-profit mountaineering organization based in Portland, Oregon and founded on July 19th, 1894 on the summit of Mt. Hood. Our mission is *to promote mountaineering through education, climbing, hiking, fellowship, safety, and to protect mountain environments.*

To support this mission, we organize and operate the largest and highest quality climbing and hiking programs in the Northwest, helping to bring over 13,000 people a year outside to experience the pristine beauty of the Pacific Northwest. Overall, we organize close to 25,000 people days of activity in the outdoors.

Mazama programs create shared growth experiences for hundreds of new outdoor enthusiasts each year. We strongly believe that these deep personal experiences in the outdoors are the roots of our motivation for conservation and stewardship.

We additionally sponsor conservation and research work through grants and related programs to protect and better understand the mountain environment, and are committed to educating the public about caring for and supporting our public lands.

Comments

In September of 2012, Mazamas went on record against new coal export facilities in the Pacific Northwest. Today we write you *to specifically oppose the construction of a coal export terminal at Longview, Washington.*

This proposal would greatly increase coal traffic and pollution in the Columbia Gorge, through the Portland-Vancouver Metro area and on the lower Columbia River.

MAZAMAS

WE CLIMB HIGH

A COMPREHENSIVE MOUNTAINEERING ORGANIZATION SINCE 1894

Mountaineering
Rock Climbing
Climbing Education
Hiking
Nordic Skiing
First Aid Courses
Conservation
Trail Maintenance
Adventure Travel

Both through our programs, classes and activities and also simply as members, Mazamas hike in the Columbia Gorge year-round. We already witness the constant roar of train traffic on the Oregon and Washington sides. We witness clouds of diesel exhaust filling the gorge. It is hard to imagine those rails carrying more trains than they do now.

We also express our concern with pushing cheap coal toward Asia for burning in coal-fired electric power plants. Coal burning is one of the biggest contributors of greenhouse gases. As citizens and protectors of the pristine Pacific Northwest, we should be taking actions to burn less, not more coal. We should be leaders in moving our societies away from coal as a primary energy source.

This proposal would negatively affect our communities and our region by increasing congestion and noise with more coal train traffic, polluting our air and local waterways, harming existing businesses, and delaying emergency responders. It would also damage mountain glaciers, aquatic ecosystems and fishing areas on the Columbia River, harm human health, increase tanker traffic and the potential for shipping accidents and spills, expand strip-mining in Wyoming and Montana, and escalate climate change.

We urge you to consider the impacts listed above in the Environmental Impact Statement (EIS). We also request that you include in the EIS a Health Impact Assessment with a public scoping process.

Thank you for your consideration.

Sincerely,

Lee Davis
Executive Director

cc: Governor John Kitzhaber
Senator Ron Wyden
Senator Jeff Merkley
Representative Earl Blumenauer
Representative Suzanne Bonamici
Representative Peter DeFazio
Representative Kurt Schrader
Representative Greg Walden

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FSC
Mixed Sources

SW Washington Health Community
Position Statement on Proposed Coal Exports

Large multinational coal companies propose to send coal mined in the Powder River Basin by rail and barge through the Pacific Northwest to be loaded onto large ships and exported to Asia. If current proposals are approved, that could result in more than 100 million metric tons of coal shipped each year. Over 38 uncovered coal trains, each one-mile long (or longer) with over 100 cars propelled by four diesel engines, could pass through Washington and/or Oregon every day.

Our specific, local concerns related to a massive increase in rail and river traffic for coal exports include:

- New, major sources of diesel pollution;
- Coal dust pollution along train tracks, in river corridors and at port sites;
- Traffic delays, including for emergency first responders, at grade-level crossings; and
- Noise pollution.

Coal trains traveling through our communities, barges, port storage and export facilities, and massive bulk cargo ships in the Columbia River and on the coast will emit significant amounts of diesel particulate pollution. There are robust correlations between these pollutants and cardiovascular and respiratory disease, reproductive health problems, and malignancy. Chronic exposure to these particulates may affect learning ability, coordination, memory, and judgment in both children and adults.

Coal dust blowing off train cars can be as much as 500 lbs. of coal dust per car per 500 miles travelled. The size and frequency of these trains may make coal dust a public health threat in itself. Exposure to coal dust is linked to asthma and lung disease. Coal particles from trains have been found in the Columbia River. Coal dust contains mercury, arsenic, and lead, elements which have been associated with neurodevelopmental delays in children.

Another concern is the potential for delays in emergency response times. For instance, there are four grade-level crossings in Longview, Washington that could detain first responders for up to 20 minutes each as long coal trains pass through town.

Additionally, coal burned abroad in Asia emits nitrous and sulfur oxides, ozone, and heavy metals such as mercury into the air, which will blow back to us on prevailing

westerly winds. Recent studies show that a significant amount of the mercury in water and the environment comes from coal burned in Asia that returns to the Pacific Northwest via atmospheric currents. In addition, burning large amounts of coal and fossil fuels simply to transport the coal will generate huge amounts of greenhouse gasses that promote and intensify climate change, itself a threat to public health and safety.

Washington and Oregon have taken steps to phase out the use of coal-generated electricity at the Transalta plant in Centralia and at the PGE Boardman plant. This is progress for the health of those living in the Pacific Northwest. Yet new, proposed coal exports would undermine this progress.

As health care professionals, providers and public health advocates, we believe the risks to human health from massive coal shipments across our state and through our communities are significant. We want to prevent new sources of morbidity and mortality and increasing costs of health care.

Together, we voice our concerns about coal exports. Specifically, we call for public review of a comprehensive Health Impact Assessment (to include cumulative effects), a region-wide Environmental Impact Statement (EIS), and site-specific EISs for each proposed terminal before any coal export facility or transport is approved by any agency.

Thank you,

Anne Battson, RN

Judy Lynn Dona Bauer, OTR/L

Wendy Biss, PhD

James Bergh, RN, PA

Marcia Bryan, RN, CDE

Brenda Call, OTR/L

R. E. Carleo, RN

Marcella Chandler, LPN, BA, MA

Cathryn Chudy, MA

Ann Marie Clifton, RN, BSN

Dian Cooper, CEO

Kate Costelloe, OTR

Elizabeth Deming, OTR/L

Dawn Doutrich, PhD, RN, CNS

Gaia Davies, MSW

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Carol Fischer, OTR/L, MEd.

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Beth Walters, RN

Barbara Wildern, RN, BSN

Charles Williams, EdD

Allison Billups Wilson, RN

Sandy Wood, COTA/L

Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

STATEMENT OF THE YAKAMA NATION REGARDING COAL EXPORT ISSUES

November 18, 2013

Given during the Oregon Physicians for Social Responsibility's Press Conference

Good morning, my name is Kristina Proszek. I am the Environmental Review Coordinator for the Yakama Nation. I have been asked to deliver the following prepared statement on behalf of the Yakama Tribal Council. The Yakama Nation is a federally recognized sovereign Indian Nation. Through the Yakama's Treaty of 1855 with the United States, the Yakama Nation has reserved certain rights. Among the various rights our ancestors reserved to themselves and future generations is the right to take fish at all usual and accustomed places, including the Columbia River, and the right to live free of such nuisances as may impair the enjoyment of these reserved rights. The proposed transportation of coal through our Nation's ancestral lands imperils these rights and compels this Council to honor its sworn duty to protect the rights that our ancestors reserved for us and for those not yet born who have no voice to advocate for themselves.

First and foremost, given the direct and indirect impacts that the coal export proposals would have on the Yakama People and our Treaty-reserved rights and resources, Yakama Nation is fully opposed to all coal export proposals, including the Millennium Bulk Terminal project at the Port of Longview. As such, Yakama Nation continues to ask all permitting agencies, including the U.S. Army Corps of Engineers and other state and local authorities to deny any and all permits related to these proposals. To be clear, Yakama Nation will not negotiate nor agree to so-called mitigation for any violations of its Treaty-reserved rights.

If the permitting agencies are not willing or able to deny the permits outright, Yakama Nation holds firm in its request to the Federal government for a comprehensive, region-wide environmental impact statement to quantify and discuss what the cumulative impacts of the three proposed coal export projects and the current coal-related activity would have on our People and the environment in the Pacific Northwest and globally.

Additionally, Yakama Nation continues to strongly support Oregon and Washington physicians and health professionals in calling for a regional, comprehensive Health Impact Assessment of current and proposed coal transport and export in the Pacific Northwest. It's important that this HIA includes a public review and comment process to ensure that all potential impacts to human health are fully identified, quantified, and discussed.

On a project-specific level, short of a denial of the permit to move forward with the Millennium Bulk Terminal, Yakama Nation is asking the U.S. Army Corps of Engineers and the Washington State Department of Ecology to quantify and discuss all potential impacts to our People and resources in their respective environmental impact statements, including impacts from the coal's origins in the Powder River Basin, through our homelands, to Asia – and back to our region in the form of toxic coal plant emissions. This broad but legally appropriate review is requested because all transportation-related impacts from the coal's source to its destination, as well as the use of the coal at its destination, will have negative direct and indirect impacts on the Yakama People, as well as on our Treaty-reserved rights and resources.

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For instance, it's imperative that the relevant agencies conduct a thorough analysis of the potential impacts of current and increased levels of rail traffic to tribal fishers, their customers, and tribal members on and near the Yakama Reservation and especially through the Columbia River Gorge. A sad history of train-related fatalities at current levels of rail traffic naturally suggests that elevated levels of rail traffic in the Columbia Basin, particularly through the Columbia Gorge, will increase mortalities to tribal members attempting to exercise their Treaty-reserved fishing and food gathering rights at usual and accustomed places. The probability of train-strike fatalities, injuries, and property damage can be quantified based on these tragic statistics, and the EISs should analyze the expected additional mortalities to tribal members and others that would be caused by the projected increase in rail traffic associated with this and all of the proposals.

Further, we have observed and it has been documented that current coal trains are already depositing coal dust on our lands and into our waters in the region. We must fully understand what the increased coal dust and rail diesel emissions will mean for our air and water quality, and for the health and wellbeing of our People and resources – with an additional 16 trains passing through the Gorge everyday going just to the Port of Longview. These cumulative impacts need to be quantified and discussed in relation to Clean Water Act requirements, among other applicable laws, regulations, and Treaty rights.

The proposed Millennium Bulk Terminal site itself would be located on a now defunct aluminum production facility that is currently undergoing a remedial investigation under Washington State's Model Toxics Control Act (MTCA). The EISs must include a full description of the extent of the contamination and how a coal port can be constructed without impeding the implementation of a remedy that protects and preserves Yakama Nation's resources. It does not seem possible that an adequate EIS can be completed if the nature of the contamination at this site is still being characterized and the method of cleanup, including cleanup levels, has not been determined. Yakama Nation expects that the post-remedy conditions of the site will be absolutely resolved before any permit is granted to commence the Millennium Bulk Terminal. The state cannot short cut cleanup of the current contamination onsite. Some of the contaminants at the proposed Millennium Bulk Terminal site include fluoride, cyanide, metals, and PCBs, which have all been shown to be toxic to aquatic receptors.

These are only a few of Yakama Nation's many concerns and the potential impacts to human health, safety and the environment that need to be fully analyzed and discussed in the environmental impact statements to be prepared by the U.S. Army Corps of Engineers and the Washington Statement Department of Ecology for the proposed Millennium Bulk Terminal at the Port of Longview. If the Millennium Bulk Terminal and other coal export permit applications are not denied outright, we look to the Federal, state and local government agencies to execute their public duties by fully examining the cumulative consequences of the Millennium Bulk Terminal before permitting it.

May it be clear, Yakama Nation stands firm in its opposition with other Northwest tribes, elected leaders, organizations, physicians and others – we say NO to coal.

This concludes the statement of the Yakama Nation.

Media Contact: Emily Washines, (509) 853-8140, wase@yakamafish-nsn.gov

Arthur M. Winer, Ph.D.
383 Lindsay Way
Eastsound, WA 98245
(360-376-5045) amwiner@ucla.edu

DATE: January 7, 2013

TO: U.S. Army Corps of Engineers
Washington Department of Ecology
Whatcom County, Washington

From: Arthur M. Winer, Ph.D.
Orcas Island Resident and Distinguished Professor Emeritus, Environmental Health Science Department, UCLA School of Public Health

RE: Significant, Adverse, and Forseeable Air Quality Impacts from the Gateway Pacific Terminal Proposed for Cherry Point, Including Localized Human Exposure, Health Effects and Environmental Justice Inequalities

My Qualifications to Comment

I have owned property on Orcas Island, WA since 1979 and have been a resident of Orcas Island since 2010 following my retirement from the UCLA School of Public Health (SPH) where I was a Distinguished Professor of Environmental Health Sciences, with a research specialty in human exposure to air pollutants, and Director of the UCLA Environmental Science and Engineering Program for nine years. I currently hold Emeritus appointments in the UCLA SPH and the UCLA Institute of the Environment and Sustainability, and I continue to conduct research, publishing four peer-reviewed journal articles in 2012.

In the course of a forty-year career, I have published two hundred peer-reviewed journal articles and sixteen book chapters on key air pollution topics. In the last 15 years, my research has focused primarily on air pollutant exposure measurements, including localized exposures related to diesel- and gasoline-mobile source emissions; community-based monitoring; and children's exposures in diesel school buses, schools and homes.

In addition to my research and teaching contributions, I have worked for three decades at the local, state, national, and international levels to promote legislation and public policies designed to address a broad range of air pollution, environmental justice, public health and urban planning concerns. Specifically, I have served as an advisor to the President's Council on Environmental Quality, EPA's Clean Air Scientific Advisory Committee, the National Academy of Sciences/National Research Council, the Health Effects Institute, California's Air Resources Board and the South Coast Air Quality Management District.

I am a member of the International Society of Exposure Analysis, the American Chemical Society, the Air and Waste Management Association, and the American Association for the Advancement of Science, and I have received numerous awards for my contributions to the air pollution field, including the Haagen-Smit Award, the Carl Moyer Award for Scientific Leadership, the American Lung Association of California's Clean Air Award, as well as commendations from Congress.

Local and Regional Air Quality Impacts: Human Exposure, Health Effects and Environmental Justice

Background

Over the past decade the focus of regulators and air pollution researchers has largely shifted from regional air pollution problems to more localized, direct exposures of populations to emissions from mobile sources such as motor vehicles and diesel locomotives. This change in focus is the result of several factors. First, in most U.S. airsheds the National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants are either already met (e.g. lead, nitrogen dioxide, sulfur dioxide, carbon monoxide) or are close to being met (ozone, PM2.5).

Second, air pollutant exposure assessments now focus specifically on determining what people are breathing where they spend their time, rather than using air quality measurements at a few widely spaced outdoor air monitoring stations to infer exposure of people many kilometers away. Third, concern has grown that focusing only on the criteria pollutants regulated under the NAAQS fails to address the potential health effects of other critical, but presently unregulated, combustion-related species such as ultrafine particles (UFP) which can cross the blood-brain barrier and penetrate cell walls.

Finally, a large body of peer-reviewed literature indicates that exposure to mobile sources emissions, e.g. diesel exhaust particulate (DEP), causes a wide range of morbidity—asthma, respiratory illness, reduced lung function, and low birth weight and premature birth in newborns—as well as increased mortality, especially in vulnerable populations such as infants, children, the elderly and pregnant women (Brunekreef et al., 1997; van Vliet et. al., 1997; Venn et al., 2001; Lin et al., 2002; Hoek et al., 2002; Janssen et al., 2003; Wilhelm and Ritz, 2003; McConnel et al., 2006; Beelen et al., 2008; Gehring et al., 2010; Hoek et al., 2010; Wellenius et al., 2012;).

Specifically regarding diesel emissions from locomotives, the California Air Resources Board conducted a risk assessment study in 2000 for the large railyard at Roseville, CA, which has the unique feature of an absence of truck traffic thereby allowing assessment of health impacts only from the diesel locomotives. In this study, Hand et al. (2004) identified cancer risk levels of 500 per million in the neighborhood immediately downwind of the railyard, and 100 per million well downwind in the Roseville community. These results were later confirmed by Cahill et al. (2011) in an independent study (see below). Both of these studies showed that a major fraction of the emissions came from idling diesel locomotives.

A. Rail Transport of Coal for the GPT Project

1. Exposure of Downwind Human Populations to Regulated and Un-Regulated Air Pollutants

   Over the past decade a major research effort has been conducted to characterize the air pollution exposures of human populations adjacent to, and downwind of, important transportation-related emission sources, including roadways, airports,

shipyards, and rail lines and rail yards. In addition to using fixed-site monitoring, much of this research has been conducted using mobile monitoring platforms (MMP) consisting of electric vehicles with no pollution of their own, on which are installed state-of-the art instruments for measuring both regulated and un-regulated air pollutants (Westerdahl et al., 2005; Hu et al., 2009a; Kozawa et al., 2009; Choi et al., 2012a; Quiros et al., 2013). These studies have shown that the impacts of emissions from these mobile sources extend up to 2-3 kilometers downwind, especially during nocturnal surface temperature inversions (Kerminen et al., 2007; Hu et al., 2009b; Choi et al., 2012a).

The frequency of diesel locomotives passing through highly populated areas under the proposed GPT project would make these rail lines essentially "line sources" for locomotive diesel exhaust, thereby producing chronic downwind air pollution impacts in adjacent populations, similar to those observed for roadways with diesel (and gasoline) vehicle traffic. These line-source emissions from the diesel locomotives themselves would be exacerbated by the air pollution from large the numbers of cars and trucks idling for long periods of time while long and slow coal trains cross roads with no over- or under-passes.

2. Data from Fixed-Site Monitoring Networks are Inadequate to Assess Exposures

It is important to stress that a scoping study that relies only on data from, or models related to, the standard fixed site monitoring network of local or regional air quality agencies in western Washington will completely fail to capture the true air pollutant exposures created by rail traffic associated with the proposed GPT project. As discussed above, it is now well recognized that a few widely scattered air monitoring stations are of little value in characterizing the highly localized exposures of populations to the air pollutants they are actually breathing in proximity to mobile source emissions.

Today it is recognized the principal value of traditional air monitoring networks is to track over long periods of time compliance of air agencies with the NAAQS for the few air pollutants regulated under the NAAQS. Indeed both Federal agencies, such as the U.S. EPA and the National Highway Transportation Agency, as well as state air agencies such as California's Air Resources Board, now require localized air monitoring adjacent to, and downwind of, transportation-related "line sources" in order to more accurately characterize the exposures and health impacts of air pollution from these major sources.

Need for Comprehensive Study: It is therefore important to measure and/or model the downwind concentrations of air pollutants, and resulting human population exposures, within 3 kilometers of the rail lines which would be used by diesel locomotives for the proposed GPT project along the entire length of those rail lines.

3. Focus on Un-Regulated Pollutants as well as Regulated Air Pollutants

The serious health effects of the air pollutants regulated under the NAAQS have been recognized for decades. This scoping study must, of course, account for exposures to diesel locomotive exhaust pollutants such as nitrogen dioxide and sulfur dioxide. And, as discussed above, assessments of exposures to NAAQS pollutants must be based on air quality measurements or modeling for populations adjacent to, and downwind from, the rail lines used for the proposed project, not just on data from distant air monitoring stations.

However, there are several key air pollutants and classes of air pollutants (e.g. heavy metals) which are presently not regulated under the NAAQS framework, but that pose potentially serious health impacts, not just morbidity but also mortality, for populations downwind of the rail lines which would be used for the proposed GPT project. Four of the most important such pollutants are diesel exhaust particulate (DEP), ultrafine particles, heavy metals and polycyclic aromatic hydrocarbons (PAH).

a. Diesel Exhaust Particulate

Based on an overwhelming body of evidence, DEP has been declared a toxic air contaminant by the U.S. EPA and the California ARB. Peer-reviewed literature from all over the world has documented both increased mortality and a wide range of morbidity effects for children and adults living adjacent to roadways with heavy diesel truck traffic (see references above). It is important to recognize that the frequency of locomotive trips for the GPT project (both loaded and empty trains) will create a diesel pollution "line source" analogous to a roadway with heavy-duty diesel truck traffic.

Need for Comprehensive Study: It is therefore important to assess the potential health impacts that could result from chronic and cumulative exposures to diesel exhaust particulates over periods as long as decades for populations living, schooling or working within the downwind plumes of GPT-related diesel locomotives.

b. Ultra-fine Particles from Diesel Locomotives

Particles less than 100 nanometers in diameter, commonly called nanoparticles or ultrafine particles (UFP), are emitted from all fossil fuel combustion sources, including diesel locomotives. Because these tiny particles are able to penetrate cell walls and cross the blood-brain barrier there is currently in the scientific and regulatory communities intense focus on their potential human health impacts. Indeed, UFP appear to have the potential to be a 'causative agent' in fresh combustion emissions responsible for degrading health in a variety of ways (Nel et al., 2006).

For example, recent results of a European expert panel elicitation study on UFP health effects suggested a high likelihood of an association between UFP exposure and cardiovascular or respiratory hospital admissions (Hoek et al., 2010). Researchers in the United States have reached similar conclusions based on animal models or epidemiological studies.

The frequency of passage of diesel locomotives hauling coal to, and returning from, the GPT facility will cause a chronic exposure of downwind human populations to elevated concentrations of ultrafine particles, especially in highly populated urban centers through which the trains will pass relatively slowly.

Need for Comprehensive Study: It is therefore important to assess the potential health impacts that could result from chronic exposures to ultrafine particles over periods as long as decades for populations living or working within the downwind plumes of GPT-related diesel locomotives.

c. Heavy Metals

In a comprehensive study of inorganic and organic aerosols downwind of the major railyard in Roseville, California, Cahill et al. (2011a) detected a number of toxic heavy metals, including nickel, lead, and copper. Disturbingly, they found increasing concentrations of the metals with decreasing particle size, suggesting that concentrations could be even higher in the ultrafine particle size range that corresponds to very high lung capture efficiencies. The presence of the very fine metals from the railyard posed a threat over and above that created by the other pollutants observed downwind of the facility. In a subsequent study, these researchers tied these very fine metallic aerosols to ischemic heart disease (Cahill et al., 2011b).

d. Polycyclic Aromatic Hydrocarbons

An important class of compound found in diesel exhaust is the polycyclic aromatic hydrocarbons (PAH), many of which are human carcinogens or mutagens. These compounds are predominately found in the fine and ultrafine particle size ranges in diesel particulate emissions. Cahill et al. (2011) identified 15 different PAH in samples of diesel particulate obtained downwind of the Roseville Railyard in California. The PAHs from locomotive diesel engines showed a markedly different PAH profile compared with emissions from heavy-duty diesel trucks and other on-road applications. Cahill et al. (2011) found that benzo(a)pyrene, one of the most toxic PAH, was detected at levels more than five times higher than in diesel truck exhaust per unit mass.

Need for Comprehensive Study: It is therefore important to assess the potential health impacts that could result from chronic exposures to heavy metals and PAH over periods as long as decades for populations living or working within the downwind plumes of GPT-related diesel locomotives.

4. Assess Indoor Exposures as well as Outdoor Air Pollution

   The rapid penetration of outdoor gaseous and particulate air pollutants into indoor environments of all kinds, including homes, shops and schools, has been studied for several decades and is now well established. Hence, the air pollutant emissions from diesel locomotives associated with the GPT project are of concern not just in ambient outdoor air, but also in indoor environments. Any scoping study must account for such indoor exposures.

Need for Comprehensive Study: It is therefore important to assess the potential health impacts that could result from chronic and cumulative indoor exposures over periods as long as decades for populations living, schooling or working within the downwind plumes of GPT-related diesel locomotives.

5. Environmental Justice Issues

   It is well recognized that mobile source emissions in urban areas often have disproportionate health impacts on minority and low income populations due to the siting of roadways and railways in low socioeconomic status (SES) and minority neighborhoods (Houston et al., 2004; Jacobson et al., 2005; Houston et al. 2006; Houston, Krudysz and Winer, 2008). Typically residents of such neighborhoods have among the lowest vehicle ownership rates and the lowest use of rail transport while their communities are disproportionately traversed and surrounded by railways and roadways. A previous study of exposure of disadvantaged populations adjacent to freeways traversing Seattle and Portland (Bae, Sandlin and Bassok, 2007) clearly indicates the potential for coal-related rail traffic through minority and high poverty neighborhoods in Seattle and other major urban centers in Washington State to result in disproportionate diesel locomotive exposure, health and noise impacts compared with more affluent areas of the region.

   In a broader context, data collection and assessment, as well as estimates of exposures and health impacts in minority and low income populations should be guided by Presidential Executive Order 12898 of February 11, 1994, entitled Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations (Federal Register 1994).

Need for Comprehensive Study: It is therefore important to assess the potential for extensive environmental justice-related disparities in exposure, health, noise and other impacts resulting from GPT Project rail transport of coal, with resulting diesel locomotive emissions, through minority and low-income neighborhoods in major urban centers of southern and western Washington.

B. On-Site Emissions at the GPT Facility

As emissions from light duty motor vehicles and highly regulated stationary sources such as utilities have been dramatically reduced over past decades throughout North America, ports and their associated transport activities have emerged as major and even dominant air pollutant emission sources in many coastal airsheds. The proposed Gateway Pacific coal export terminal is expected to be no exception to this trend. The presence of a wide range of diesel equipment, including fork lifts, cranes, and trucks, in addition to the arrival, departure and especially idling of diesel locomotives, has the potential to make the GPT facility a diesel emission "hot spot."

Given the wide range of morbidity effects, and in some cases mortality, caused by diesel exhaust particulate, ultrafine particles, and other combustion-related pollutants, the air pollution emitted from the GPT facility has the potential to significantly impact human health of the residents of adjacent and nearby communities. Again, it is not sufficient to rely on modeling the air pollutant levels likely to be encountered at monitoring stations long distances from the GPT facility. The impacts of the facility must be modeled with high spatial and temporal resolution adjacent to, and many kilometers downwind from, the port facility.

Need for Comprehensive Study: It is therefore important to quantitatively determine the extent and combined impacts of both regulated and un-regulated (e.g. UFP and DEP) emissions at, adjacent to, and downwind of the GPT facility from all combustion sources within the facility, with particular attention to the health impacts on adjacent and nearby communities.

C. Ship Emissions at Loading Facilities and Within the Salish Sea

Because of the generally poor quality of fuel used in international bulk carriers, especially the high sulfur content of bunker fuel, and the extensive idling of ships when in port and while waiting offshore, the air pollutant emissions at the GPT facility and within the Salish Sea from coal carriers are expected to be egregious. Such emissions have the potential to significantly degrade air quality and visibility not only locally at the facility itself but throughout the region, especially given the large numbers and frequency of such carriers in connection with this proposed coal exporting facility. Again, to adequately assess these impacts requires modeling with high spatial resolution, and not simply modeling anticipated air quality at a few widely scattered air monitoring stations.

Need for Comprehensive Study: It is therefore important to quantitatively determine with high spatial resolution the extent and impacts of both regulated and un-regulated (e.g. DEP and UFP) emissions at, adjacent to, and downwind of the GPT facility from all combustion sources associated with the facility, with particular attention to the health impacts on adjacent and nearby communities.

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October 30, 2012

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RE: Ecological Impacts of Proposed Coal Shipping on the Columbia River Port of Morrow and Port Westward, Oregon

Mr. Winter:

This technical memorandum provides Leyda Consulting, Inc.'s (LCI) expert ecological review of the proposed Coyote Island Terminal Dock and associated coal shipping operation involving rail and water routes (the Morrow Pacific Project or MPP). The location of the investigation is the Port of Morrow near Boardman, OR, in Morrow County (T4N, R25E W.M.), with proposed barges shipping coal to Port Westward near Clatskanie, OR in Columbia County (T8N, R4W W.M.).

The current proposal is to construct facilities to ship up to 8 million metric tons (8,760,000 short tons) of low-sulfur intermountain US coal to Asia.[1] The applicant will then hire a barging company to move the coal along the Columbia River to Port Westward, and then the coal will be transloaded over the water by Pacific Transloading from enclosed river barges to ocean-going vessels operated by shipping companies commissioned by the buyer of the coal.[2]

The analysis in the Environmental Review Document (ERD) depends upon certain assumptions that, based on my opinion, are not certain enough to constrain a proper analysis of potential ecological impacts. If the export terminal is constructed, there appears to be no enforceable condition that the coal shipped would be exclusively low-sulfur coal from the intermountain west, or that enclosed river barges and storage facilities would be used in perpetuity. There also appears to be no limitations on the design of the coal export terminal, which could be amended in the future or changed subsequent to construction in the event of repair or other alternations. There is no apparent information in the ERD that these assumptions would be imposed as enforceable conditions on the operation of the MPP by either state or federal regulatory agencies.

The applicant states that there is a demand for shipping intermountain west coal through US west coast ports to Asia, and that this proposal fills that demand.[3] In Appendix J of the

[1] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. Executive Summary, p. 1
[2] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. Executive Summary, p. 1, 2.
[3] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 1-3.

Environmental Review, a map of US coal producing regions is shown.[4] The map clearly shows the presence of bituminous coal in the Uinta Basin of Utah and Colorado, and in central Montana, which is mapped as the same type of coal found in the Appalachian Mountains that may contain higher amounts of sulfur. The Utah Department of Natural Resources estimates that the existing coal fields in Utah contain almost 15,000,000,000 short tons of recoverable resource[5], and a large majority of that coal is moved by rail.[6] Given the proximity and demand, it is reasonable to assume for this ecological review that any type of coal may be shipped from the proposed terminal, including the higher sulfur, higher mercury bituminous coal. Studies pertaining to pollution stemming from sulfidic impurities in coal, such as acid drainage and dissolved metals, are therefore relevant to considering the potential impacts of MPP.

Based on the proposed location of the MPP, primary considerations for assessing impacts to ecological receptors includes the proximity of the Port of Morrow to the Umatilla National Wildlife Refuge and the presence of sensitive and/or protected areas at the Port of Morrow, Port of Westward and along the Columbia River shipping route. Fish listed under the Endangered Species Act include steelhead (*Oncorhynchus mykiss*) (threatened), Chinook salmon (*O. tshawytscha*) (endangered and threatened), chum salmon (*O. keta*) (threatened), coho salmon (*O. kisutch*) (threatened), sockeye salmon (*O. nerka*) (endangered), bull trout (*Salvelinus confluentus*) (threatened), green sturgeon (*Acipenser medirostris*) (threatened), eulachon (*Thaleichthys pacificus*) (threatened). Critical habitat for salmon species occurs in the area.

I. Fugitive Coal Dust Impacts

A. Dust Impacts from Rail Transportation of Coal

This review of the available literature demonstrates the potential for coal dust to cause adverse impacts to a wide range of ecological receptors, including mammals, fish and benthic communities. The ERD assumes that the operations at the MPP will not result in substantial emissions of coal dust, however those assumptions have not been supported by adequate information.

The proposed shipping operation will generate coal dust at various points and the potential exists for a discharge of the coal dust to land and water along the rail and river routes. According to the ERD, the coal trains will require 4.8 hours to unload, but will likely be split to avoid blocking traffic and then require 12 hours to unload.[7] The applicant also mentions that

[4] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. Appendix J - Coal Toxicology Report, p. 6.
[5] Utah Department of Natural Resources, Utah Coal Reserves by Coal Field, 2011 (October 3, 2012) (available at http://geology.utah.gov/emp/energydata/statistics/coal2.0/pdf/T2.3%20&%20T2.1.pdf).
[6] Utah Department of Natural Resources, Distribution of Utah Coal be Method of Transportation, 1970-2010 (December 14, 2011) (available at http://geology.utah.gov/emp/energydata/statistics/coal2.0/pdf/T2.14%20&%20F2.5.pdf).
[7] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-11.

"prior to shipping, the coal will be coated with an approved surfactant to reduce transit coal dust losses by 85%."[8]

In Appendix U of the ERD, the applicant states that the rail cars may be treated with a product that reduces coal dust discharge during transit.[9] The shipper is responsible for treating the loaded cars to reduce dust 85% compared to untreated cars. According to this UP [Union Pacific] loading tariff, the topper application applies only to Powder River Basin mines, not to all coal shipments bound for the proposed terminal, nor to any other coal mined in the "intermountain west," and only those "for subsequent movement on UP." So, there is the potential for any coal mined anywhere else besides the Powder River Basin to escape treatment of any kind, as well as coal shipped on any other line aside from UP.

The same document also says there are alternatives to using the topper agent: "shipper or shipper's loading operator may adopt an alternative coal dust mitigation plan involving other measures (e.g. compaction or other technology)" and that BNSF will review test results for those measures, and be satisfied that "any product involving topper agents, devices or appurtenances utilized to control the release of coal dust will not adversely impact railroad employees, property, locomotives, or owned cars."

The original statement in the Environmental Review that "prior to shipping, the coal will be coated with an approved surfactant to reduce transit coal dust losses by 85%,"[10] is not accurate. Other measures approved by BNSF may be used, such as "compaction or other technology." Additionally, no oversight by any government agency or independent authority will monitor any dust control measures or alternatives. The dust control measures are merely voluntary and nothing in this application indicates any dust control measures during rail transport beyond this treatment, so there is no guarantee of any dust control measure being applied. Prevention of harm to the ecosystem is not a criterion of coal dust release. Essentially, UP or BNSF makes the final decision as to whether coal dust reduction is adequate, which does not contain any measures guaranteeing compliance, and could likely result in excessive coal dust discharge into the ecosystem. The assumption that these control measures will be effective is therefore unsupported because there is not a clear plan for how coal will be handled and managed.

Most importantly, the Appendix U document, titled "Item 216," essentially states that no coal dust mitigation measures are required at all: "in order to comply with the BNSF Operating Rule, regarding coal dust mitigation measures, Shippers must adopt measures to comply with this Item as soon as practicable." That means that if implementing measures are not "practicable," they don't have to occur. It could be decades before the companies making this agreement decide it is "practicable." Based on the applicant's coal dust mitigation agreement, it is clear that the rail cars do not have to be treated to begin shipping coal, and there is no clear indication of how much time may pass after the proposed shipments begin before they are treated. Therefore,

[8] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-4.
[9] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. Appendix U - Required Loading Measures, UP6603-C, Item 216 Required Loading Measures to Mitigate Coal Dust.
[10] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-4.

ecological impacts from coal dust should be considered as if no topping agent or mitigation measures will occur.

The following photographs[11] show how Powder River Basin coal fragments in just a few days under normal indoor conditions:

Results of Test Program 1

The first test simply allowed large PRB coal particles to sit at ambient conditions (inside a building) for 6 days while photos were taken. Figures 4a–4f show a series of photos of one particle over time.

Figure 4a. PRB coal at start of test.

Figure 4b. PRB coal after 5 hours.

Figure 4c. PRB coal after 2 days.

Figure 4d. PRB coal after 4 days.

Figure 4e. PRB coal after 6 days.

Figure 4f. PRB coal after 6 days.

PRB coal is highly friable, that is, prone to breaking apart.[12] It is likely that coal will crack apart during transport from the mine to the proposed shipping terminal, and thus produce more

[11] Hossfeld, R.J. and R. Hatt. PRB Coal Degradation - Causes and Cures. Private company research accessed online at http://www.prbcoals.com/pdf/paper_archives/56538.pdf on 10/18/12.
[12] Hossfeld, R.J. and R. Hatt. PRB Coal Degradation - Causes and Cures. Private company research accessed online at http://www.prbcoals.com/pdf/paper_archives/56538.pdf on 10/18/12.

coal dust in transport than the intact chunks. If the topping agent treatment actually occurs, and if it covers the top part of the coal in the rail car, then if/when the coal cracks during transport, the new surfaces will not be treated and could produce large amounts of coal dust along the way. The photographs above show PRB coal in an indoor setting - outdoor transportation through dry, windy corridors could accelerate the dusting process. At the Port of Morrow, 29,000 tons of dusty, cracked coal would be sitting in rail cars waiting for transfer to barges at the proposed export terminal.

The air quality application shows that particulate matter will be released from the Engart dust extractors at the rail car unloading station.[13] Appendix E - Vendor Information - Scrubbers page 2 of 3, Table 1 states, "Particulate Matter Emissions - lbs/hr - 0.13." Form AQ230, page 2 of the application says the operation schedule is year-round, projected for 8,760 hours per year. That means the Engart dust extractor will release approximately 1,139 pounds of coal dust per year.

In an expert report authored by Dr. Phyllis Fox, revised fugitive dust particulate matter emissions are presented. Dr. Fox calculates emissions from transfers to be approximately 139 tons/year at the Port of Morrow, which is likely to significantly underestimate the total emissions. Moreover, Dr. Fox finds the emission estimates at Port Westward to be wholly unsupportable. These coal dust emissions, and other emissions from moving the coal, need to be closely examined for ecological effects.

B. Harmful Pollutants in Coal and Coal Dust

The applicant states that coal dust is a non-carcinogen, and that "coal dust itself does not require any special consideration in the air quality assessment other than it is a source of particulate matter."[14] Fugitive coal dust air emissions of antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, selenium, and uranium combined are estimated by the applicant at 0.00000666 tons per year (0.01332 pounds = 0.213 oz. = 6.04g).[15] Coal contains elements mentioned by the applicant, and also tin (Sn), boron (B), vanadium (Va), copper (Cu), molybdenum (Mo), and zinc (Zn),[16] among others.

The actual emissions of trace elements could be much greater than 6.04g given the estimated 163 tons of coal dust emissions per year. Table 1 presents the potential contents of some trace elements in three types of US coals.[17] An estimate of the potential weight of the trace elements in 163 tons of coal dust is included in the far right column, based on the Powder River column. The Wasatch Formation is part of the Powder River Basin. The contents of trace elements can vary among different types of coal.

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[13] Air Contaminant Discharge Permit Application. Coyote Island Terminal, LLC. Received August 3, 2012. Golder & Associates, July 26, 2012.

[14] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-130.

[15] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-141.

[16] Lucas, S.A, and J. Planner. Grounded or submerged bulk carrier: The potential for leaching of coal trace elements to seawater. *Marine Pollution Bulletin* 64 (2012) 1012-1017.

[17] Lindahl, P.C. and R.B. Finkelman. Factors Influencing Trace Element Variations in US Coals *in* Overview of Mineral Matter in US Coals. Argonne National Laboratory. Accessed online at http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/Volumes/Vol29-4.pdf

Table 1. Concentrations of Selected Elements in Coal Samples from Black Mesa, Powder River, and San Juan Regions.[18]

Component	Black Mesa	Powder River	San Juan		~Amount in 163 tons PRB
	Percent	Percent	Percent		Tons (pounds)
Ash	8.0	9.9	21.1		16
Silicon, Si	1.1	1.5	5.4		2.4
Aluminum, Al	0.69	0.78	2.7		1.3
Calcium, Ca	0.78	1.1	0.67		1.8
Magnesium, Mg	0.1	0.2	0.1		0.3 (600)
Sodium, Na	0.09	0.1	0.2		0.2 (400)
Potassium, K	0.04	0.05	0.16		0.08 (160)
Iron, Fe	0.31	0.54	0.54		0.9 (1,800)
Titanium, Ti	0.05	0.047	0.11		0.08 (160)
	ppm	ppm	ppm		
Copper, Cu	5.5	11.2	13.3		0.0018 (3.6)
Thorium, Th	2.2	4.3	5.9		0.0007 (1.4)
Zinc, Zn	5.6	20	15.1		0.0033 (6.5)
Chromium, Cr	3	7	5		0.0011 (2.3)
Nickel, Ni	2	5	3		0.0008 (1.6)
Vanadium, V	7	15	20		0.0024 (4.9)
Manganese, Mn	9.7	51	29		0.0083 (16.6)
Lithium, Li	3.9	5.9	19.7		0.001 (1.9)
Lead, Pb	2.7	5.6	19.7		0.0009 (1.8)
Selenium, Se	1.6	1.7	2		0.0003 (0.6)
Boron, B	300	300	300		0.049 (97.8)
Strontium, Sr	150	200	100		0.033 (65.2)
Niobium, Nb	1.5	1.5	3		0.0002 (0.5)
Zirconium, Zr	15	15	50		0.002 (4.9)
		PRB Wasatch Formation			
Cadmium, Cd		0.06			0.00001 (0.02)
Uranium, U		1.2			0.0002 (0.4)
Arsenic, As		0.8			0.0001 (0.3)
Fluorine, F		67			0.011 (21.8)
Barium, Ba		70			0.011 (22.8)
Cobalt, Co		1.5			0.0002 (0.5)
Molybdenum, Mo		0.7			0.0001 (0.2)
Scandium, Sc		3			0.0005 (1.0)
Yttrium, Y		7			0.0011 (2.3)

[18] Lindahl, P.C. and R.B. Finkelman. Factors Influencing Trace Element Variations in US Coals *in* Overview of Mineral Matter in US Coals. Argonne National Laboratory. Accessed online at http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/Volumes/Vol29-4.pdf on 10/12/12.

Coal dust is implicated in causing health problems in humans because of its unique properties, which suggests that it may also harm other organisms in the ecosystem. In humans, "recent investigation of coal workers' pneumoconiosis (also known as black lung disease) suggests that finely disseminated pyrite grains within coal dust may be responsible for the inflammation of lung tissue that leads to development of lung fibrosis (Finkelman *et al.* 2006). Possible human health issues may also arise from inhalation of airborne "environmental" particulate coal owing to the fact that: (1) it can occur in size fractions (e.g., PM2.5; <2.5 μm) that are potentially hazardous (Zheng *et al*. 1999); and (2) because it may be enriched in pyrite and/or toxic trace elements such as As, Hg, Se, Cd, and Cr (Eskenazy 1995; Smith *et al*. 1998; Querol *et al*. 1999; Finkelman *et al*. 2006)."[19] [author cites Finkelman *et al*. 2006, *Geotimes*, 51, 24–28; Zheng *et al*. 1999, *International Journal of Coal Geology*, 40, 119–132; Eskenazy 1995, *Chemical Geology*, 119, 239–254; Smith *et al*. 1998, *Advances in Agronomy*, 64, 149–195; Querol *et al*. 1999, *International Journal of Coal Geology*, 40, 175–188].

In addition, "many of the coal components are mutagenic and carcinogenic (da Silva et al., 2000a); for instance, quartz could be a prominent risk factor for lung cancer in coal miners (Borm and Tran, 2002), and the International Agency for Research on Cancer (IARC) classified it into IARC's Group 1 (carcinogenic to humans), due to sufficient evidence for carcinogenicity in experimental animals and in humans (IARC, 2010). Heavy metals such as arsenic, cadmium, as well as polycyclic aromatic hydrocarbons (PAHs), present in coal, are also well recognized carcinogens (da Silva *et al*., 2000a, 2000b). Coal dust extracts have also been reported to be cytotoxic and mutagenic in mammalian systems (Ulker *et al*., 2008). Oxidative DNA damage was observed to be significantly higher in lymphocytes of retired coal miners than in controls (Shins *et al.*, 1995). There was an increase in the frequencies of sister chromatid exchanges, chromosomal aberrations, and micronucleus in underground coal miners, indicating the genetic damage due to coal dust exposure (Donbak *et al*., 2005)."[20] [author cites Borm and Tran, 2002, *Ann Occup Hyg*, 46:25–32; IARC, A review of human carcinogens. *Monographs on the evaluation of the carcinogenic risk of chemicals to humans* Genova: IARC Pres, 2010; da Silva *et al*., 2000a, *Mutat Res* 470:39–51; da Silva *et al*., 2000b, *Environ Mol Mutagen* 35:270–8; Ulker *et al*., 2008, *Environ Mol Mutagen* 2008;49:232–7; Shins *et al.*, 1995, *Int Arch Occup Environ Health* 67:153–7; Donbak *et al*., 2005, *Mutat Res* 2005;588:82–7].

"Moreover, airborne coal particles as well as coal tailings are rich in potentially toxic hydrocarbons and genotoxic metals, among other contaminants (Celik *et al*., 2007), that ultimately may lead to profound changes in cells, tissues, populations, and ecosystems (Leffa *et al*., 2010)."[21] [author cites Celik *et al*., 2007, *Mutat Res* 627:158–63; Leffa *et al*., 2010, *Environ Contam Toxicol* 59:614–21]. Moving coal results in discharges of these contaminants in

[19] Bounds, W.J. and K.H. Johannesson. Arsenic Addition to Soils from Airborne Coal Dust Originating at a Major Coal Shipping Terminal. *Water Air Soil Pollut*. (2007) 185:195–207.
[20] Cabarcas-Montalvo, M. *et al.* Genotoxic effects in blood cells of Mus musculus and Iguana iguana living near coal mining areas in Colombia. *Science of the Total Environment* 416 (2012) 208–214.
[21] Cabarcas-Montalvo, M. *et al.* Genotoxic effects in blood cells of Mus musculus and Iguana iguana living near coal mining areas in Colombia. *Science of the Total Environment* 416 (2012) 208–214.

particulate matter along transport routes such as roadways, and "elevated levels of particulate matter have been associated with significant negative effects on human health."[22]

Arsenic in coal is an element of "major concern."[23] Coal dust was studied at a coal shipping terminal in Norfolk, Virginia to assess potential ecological effects of the 35 tons of particulate coal released into the air during the year 2000.[24] "Black, gritty veneers of what appears to be particulate coal coating objects (e.g., automobiles, window sills, plants, etc.) are common in both Norfolk and Portsmouth, Virginia, and anecdotal accounts suggest that such veneers are more prevalent in the West Ghent neighborhood of Norfolk, proximal to the Lambert's Point Docks. These thin coatings of probable coal dust suggest that airborne transport of coal dust from the Lambert's Point Docks is prevalent in the region."[25]

The researchers in the Norfolk study sampled soil 4 cm below the soil down to 32 cm.[26] They found particulate coal in the samples varying from 1 - 20% of the sample by weight; the highest sample was found less than one kilometer away, and a sample 5.5 km away had a value of 3.4% coal by weight. The Great Dismal Swamp, approximately 25 miles away, was also sampled in two places, and coal dust was found at all depths from 4 - 32 cm, ranging from 1.0 - 2.02% by weight. In the Norfolk soil samples, arsenic (As) concentrations from sand-sized coal particles were as high as 17.4 mg/kg, with an average of 7.3 mg/kg. In the whole soil sample, "arsenic concentrations for the total (i.e., bulk) soil digests (silicate minerals, metal oxides, amorphous phases, organic matter, and particulate coal), performed on aliquots from 8 cm depth for each soil core, ranged from a high of 30.5 mg/kg to a low of 3.0 mg/kg, with a mean As value of 13.3 mg/kg."[27]

In Colombia, mice and iguanas captured near coal mines had significantly more DNA damage than control organisms far from coal mines.[28] The coal dust from the mines may have been instrumental in damaging the organisms, and the author remarked, "water droplets can capture coal dust, and this is an efficient method to decrease respirable coal dust." "Given the strong rainy season that took place in late 2010 and early 2011 in Colombia, the concentrations of genotoxic compounds could have decreased as a result of heavy precipitations."[29] Given the ability of coal dust to migrate from coal shipping terminals as demonstrated in the Norfolk study,

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[22] Aneja, V, *et al.* Characterization of particulate matter (PM10) related to surface coal mining operations in Appalachia. *Atmospheric Environment* 54 (2012) 496-501.
[23] Lucas, S.A, and J. Planner. Grounded or submerged bulk carrier: The potential for leaching of coal trace elements to seawater. *Marine Pollution Bulletin* 64 (2012) 1012-1017.
[24] Bounds, W.J. and K.H. Johannesson. Arsenic Addition to Soils from Airborne Coal Dust Originating at a Major Coal Shipping Terminal. *Water Air Soil Pollut*. (2007) 185:195–207.
[25] Bounds, W.J. and K.H. Johannesson. Arsenic Addition to Soils from Airborne Coal Dust Originating at a Major Coal Shipping Terminal. *Water Air Soil Pollut*. (2007) 185:195–207.
[26] Bounds, W.J. and K.H. Johannesson. Arsenic Addition to Soils from Airborne Coal Dust Originating at a Major Coal Shipping Terminal. *Water Air Soil Pollut*. (2007) 185:195–207.
[27] Bounds, W.J. and K.H. Johannesson. Arsenic Addition to Soils from Airborne Coal Dust Originating at a Major Coal Shipping Terminal. *Water Air Soil Pollut*. (2007) 185:195–207.
[28] Cabarcas-Montalvo, M. *et al.* Genotoxic effects in blood cells of Mus musculus and Iguana iguana living near coal mining areas in Colombia. *Science of the Total Environment* 416 (2012) 208–214.
[29] Cabarcas-Montalvo, M. *et al.* Genotoxic effects in blood cells of Mus musculus and Iguana iguana living near coal mining areas in Colombia. *Science of the Total Environment* 416 (2012) 208–214.

the genotoxic effects of coal can be a serious threat to mammals and reptiles on a landscape scale, as the Colombian study demonstrates.

A study of wild rats (*Rattus rattus*) and mice (*Mus musculus*) found DNA damage in the specimens trapped near a coal mine and processing plant that prepares coal for transport by crushing it. Coal dust was implicated as the likely cause of this damage: "the rodent species investigated in the mining area are subject to exposure due to different mining activities, specifically, stripping and crushing of coal. The first activity includes the extraction of rocks and transportation to the crushing machines. During the crushing procedure, coal is processed into small particles in order to enable transportation. These activities are liberating great quantities of fugitive particles into the environment which contain ashes including PAHs and toxic gases [4]. During the crushing process of the coal large quantities of coal dust particles can be spread into the surrounding environment and they are deposited on the surfaces of the plants or in river beds. Results similar to ours were obtained in a biomonitoring study conducted in a carboniferous areas using wild rodent species *Ctenomys torquatus* [12]."[30] [author cites (4) Carbones del Caribe S.A., Plan de Manejo Ambiental, Flanco Occidental del Sinclinal del R´ıo San Pedro M´odulo D (Wenceslao), Departamento de Planeaci´on, 1996; (12) Da Silva, J, *et al*. *Environ. Mol. Mutagen.* 35 (2000) 270–278].

Coal, when deposited in water, can be harmful to aquatic organisms, as one study at the Roberts Bank, BC, Canada coal terminal addresses. "The benthos, composed of organisms dwelling on the sea bottom and in sediments are the most greatly affected due to the disturbance of the bottom caused by deposition of coal particles. Anoxic conditions, evident from the presence of hydrogen sulphide, in the sediments receiving very high levels of organic input (including coal), caused by the consumption of oxygen during the degradation (oxidation) of organic matter, would likely have the most detrimental impact on the benthic florae and faunae. The ecological contribution of bottom microinvertebrates is very significant, as larvae from clams, mussels, barnacles, and crabs drift out to sea and constitute a substantial proportion of the seasonal food for juvenile salmonids and herring. Damage to the benthos therefore has serious implications for both the mature invertebrate populations as well as those creatures that predate upon the benthic larvae."[31] A similar effect could occur at the proposed Columbia River terminals if coal dust settles on the river bottom, and could potentially affect juvenile salmonid benthic food sources in the Umatilla National Wildlife Refuge, which extends into the Columbia River near the proposed Port of Morrow terminal.

Coal can accumulate in sediments around coal terminals over time, even in moving water such as an estuary with river and tidal currents. Shown below is a map of soil percent coal dust concentrations, which accrued from 1977-1999 at the Roberts Bank coal terminal. "NHS" in the map caption stands for "non-hydrolysable solids," a part of the coal that can be measured in the

[30] Leon, G, et al. Genotoxic effects in wild rodents (Rattus rattus and Mus musculus) in an open coal mining area. *Mutation Research* 630 (2007) 42-49.
[31] Johnson, R. and R.M. Bustin. Coal dust dispersal around a marine coal terminal (1977-1999), British Columbia: The fate of coal dust in the marine environment. *International Journal of Coal Geology* 68 (2006) 57–69.

lab. NHS values, which give an indication of the coal content in marine sediments, are less than the total coal, which includes hydrolysable solids (organic content).[32]

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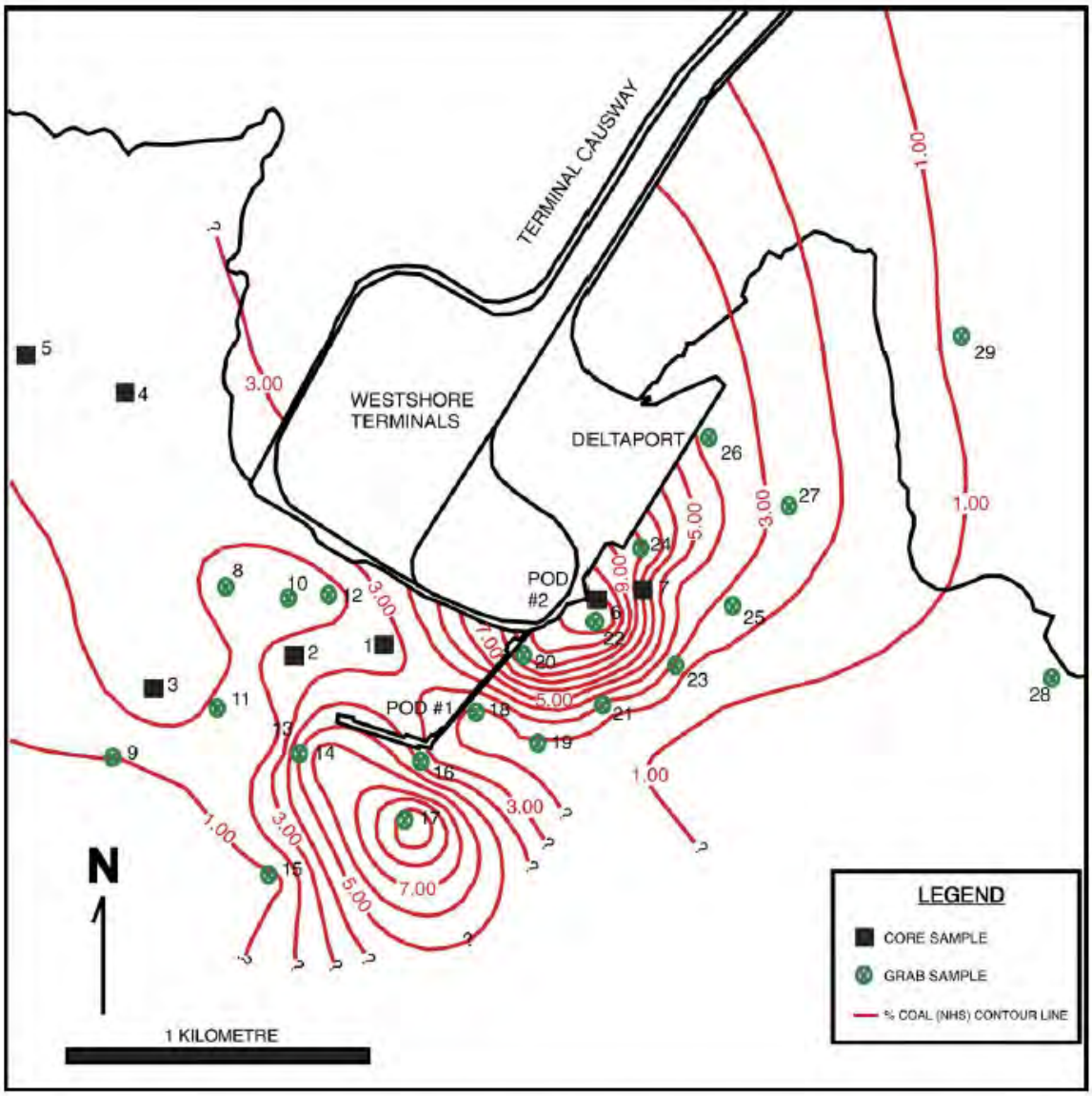

Fig. 2. Sample location and coal dust distribution in surface sediment as measured in weight percent NHS.

Coal dust from shipping terminals in other countries also raise environmental concerns. In South Africa, "despite the adoption of several dust abatement mechanisms such as water sprays and wind breaks, the coal operations, which involve shunting, stockpiles, conveyer belts and ship loading, create dust which is a problem in the harbour and surrounding areas, not only on wetland species, but also on other plant communities in the vicinity, as well as on human

[32] Johnson, R. and R.M. Bustin. Coal dust dispersal around a marine coal terminal (1977-1999), British Columbia: The fate of coal dust in the marine environment. *International Journal of Coal Geology* 68 (2006) 57–69.

health."[33] Wetland trees contaminated with coal dust 3 km from the coal terminal were found to have reduced CO_2 exchange (32-39%), transpiration (28% less), and photosynthetic activity.[34]

Conclusions. The Environmental Review Document does not adequately address the potential for fugitive dust from coal cars, emissions from dust control systems, and covered conveyor systems, or the estimated mass of coal dust that will be emitted each year. The effects of the discharge of 163 tons of coal dust annually as identified in the Fox report should be addressed. The Norfolk study found coal dust and arsenic in soils many kilometers away, stemming from a coal terminal authorized to release 35 tons of coal dust per year. The Roberts Bank study shows up to 10% coal particles in the aquatic sediment near the terminal. These impacts should be addressed for the Columbia River and Umatilla National Wildlife Refuge.

The cracking of coal and the effect of the topper agent should be discussed and the wind emissions from the rail cars estimated. Long-term deposition of coal dust has been documented at other coal shipping terminals, and an estimate should be included in the ERD. An analysis of trace elements, such as arsenic and heavy metals, should be multiplied by the mass of coal discharged and presented for review. The potential effects of coal dust on wildlife should also be discussed for the long-term.

Emissions from an accidental explosion should also be presented. The ERD should include a discussion of dust emissions in transit when no topper is applied, and provide more durable and government enforceable assurances that 1) only Powder River Basin coal will ever be shipped through the terminal for the life of the terminal, and 2) that all shipments will receive dust mitigation measures absolutely. A coal dust monitoring plan should also be presented for all phases of the shipping operation, and local vegetation should also be monitored for coal dust. Any contingency plans should include shutting down the terminal to prevent environmental contamination.

II. Process Water Impacts

Industrial water will be recycled through concrete sump basins, clarifiers with flocculants, and to a filter press that will separate the coal from the water, deposit the coal on to the conveyor, and send the water back through the sprayer system. The system is intended to deliver a 21,000 gallon wash-down of the coal buildings once per week. The water is to be contained in sumps, and is proposed for re-use after treatment with the clarifier. [35]

Despite the assurance of a self-contained system with no leaching, the applicant says that an Oregon DEQ Water Pollution Control Facility Permit for an "industrial wastewater discharge (coal dust abatement)" "pertains to the MPP," as does an Oregon 1200-Z stormwater permit, and

[33] Naidoo, G. and Y. Naidoo. Coal dust pollution effects on wetland tree species in Richards Bay, South Africa. *Wetlands Ecology and Management* (2005) 13: 509–515.
[34] Naidoo, G. and Y. Naidoo. Coal dust pollution effects on wetland tree species in Richards Bay, South Africa. *Wetlands Ecology and Management* (2005) 13: 509–515.
[35] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-193-194.

a Removal/Fill permit.[36] Because the applicant intends to apply for a permit to discharge coal dust abatement water, it is clear that the system will not be self-contained, and that the risk of a discharge exists. In other words, if there was no discharge, they would not need a permit. So it makes sense to examine the potential ecological impacts of coal dust wash water to the environment.

Considering that the applicant considers emitting approximately 1,139 pounds of coal dust from the rail car unloader portion of the dust control system alone to be "less than significant air quality impacts,"[37] and did not mention the dust system discharge, and that the applicant underestimated emitting approximately 163 tons of coal dust annually, it is possible that the actual discharges of process water requiring this industrial wastewater discharge permit are similarly understated. In stormwater systems there are generally emergency overflows built in, and it is possible that the actual process water system will have some emergency overflow, or that it will leach into the ground via the sumps (hence the permit requirement).

More details about the locations and management of the 21,000 gallons of wash water should be examined as well. Failsafe mechanisms such as freezing protection, breakdown and repair protocols, and routine maintenance shut-downs should be evaluated, because if the system is not operating then process water could be released.

If a discharge of the coal-laden process water occurred, the effects could be similar to the effects of the stormwater drainages expected from the runoff produced from the 29,000 tons[38] of coal exposed to the elements in the rail cars. Some potential effects of coal-affected water infiltrating are discussed in the Stormwater section elsewhere in this document.

Conclusions. The specifics of how the facility will handle process water to avoid discharge should be presented, and any potential discharges should be assessed for contribution of coal dust slurry to the environment. Contingency plans for system breakdowns or regular maintenance should also be assessed. Effects of discharge to groundwater should be discussed, including likely movement through soils and soil composition and risk assessment.

III. Impacts to Fisheries

The proposed Port of Morrow terminal dock is adjacent to the Umatilla National Wildlife Refuge, which extends into the Columbia River.[39] The 4-5 tugs required for the operation will consume 2,500 - 4,000 gallons of diesel fuel per day, and will be re-fueled every five to seven

[36] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-187-188.
[37] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-147.
[38] The tracks can accommodate up to two unit trains; each train will carry approximately 14,500 short tons (1 short ton = 2,000 lbs.) of coal, for a maximum total of 29,000 tons in two trains. Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-11.
[39] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. Port of Morrow Zoning Map, Fig. 3.3-2.

days, and operate 24 hours per day.[40] The ocean-going vessels (OGVs) will consume 50 tons of fuel per day at sea and 5 - 7 tons while in port.[41] The transloader at Port Westward may incorporate diesel storage tanks and a vacuum system for collection of spilled coal.[42] The presence and operation of vehicles requiring liquid petroleum in such large quantities presents a chance that fuel could be spilled into the water, or that residual fuel from routine operations could be discharged into the river. Such a discharge could adversely affect the aquatic ecosystem. In addition, exhaust fumes may also produce polycyclic aromatic hydrocarbons (PAHs) that could harm aquatic life if sufficient quantities are generated.

Nitrogen and sulfur inputs to the environment are also a concern. In a report by AMI Environmental titled AERMOD Modeling of Air Quality Impacts of the Proposed Morrow Pacific Project (October 2012), estimated emissions are presented for the Port of Morrow and Port Westward:

Pollutant Emissions for Modeled Sources at Port of Morrow

Emission Sources	NO_x (tpy)	1-hr NO_x (lb/hr)	SO_2 (tpy)	1-hr SO_2 (lb/hr)	$PM_{2.5}$ (tpy)	24-hr $PM_{2.5}$ (lb/hr)
Train unloading	492	135.09	0.3	0.824	12.8	3.51
Tug boat	39	13.76	0.0088	0.0031	0.92	0.32
Storage facility	--	--	--	--	0.012	0.0027
Open barge	--	--	--	--	--	4.341
Open train	--	--	--	--	--	4.35

Pollutant Emissions for Modeled Sources at Port Westward

Emission Sources	NO_x (tpy)	1-hr NO_x (lb/hr)	SO_2 (tpy)	1-hr SO_2 (lb/hr)
Panamax	81.5	18.61	14.7	3.36
Transloader (emergency power)	281	64.16	0.048	0.011
Transloader (shore power)	0.33	0.0753	7.9e-5	1.80e-5
Tug boat	32	7.31	0.0042	0.00096

These emissions could change the water quality in the Columbia River over time, depending on the amount deposited and area affected. The potential effects of these emissions on salmonid life cycle, habitat, and food supply should be addressed.

[40] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-13.
[41] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-13.
[42] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-16.

Fuel Discharges. A large number of studies focus on the effects of polycyclic aromatic hydrocarbons (PAHs), chemicals that are found in petroleum, and are often found in areas where petroleum is spilled, transported, and combusted.[43] Diesel contains PAHs, as does other forms of petroleum (p. 2657).[44] "The percentage of PAHs in crude oil, Bunker C oil, and No. 2 diesel oil are about 1%, 4%, and 9% by weight, respectively" (p. 104).[45]

Oil and/or diesel sheen on the water surface is harmful to fish. "Fish mortality following spills has often been attributed to the formation of a layer of oil (sheen) on the water. Sheen limits the oxygen exchange between air and water, and both sheen and dissolved constituents may coat the gills of fish causing lesions on respiratory surfaces affecting respiration (p. 2657) [author cites Green, J.; Trett, M. W. Fate and Effects of Oil in Freshwater; Elsevier: London, 1989]."[46] The sheen itself represents pure product floating on the water surface; the concentration there would be much higher than a grab sample several inches below the water surface.

Diesel is harmful to salmonids, and one study determined the mortality rates for rainbow trout (*Oncorhynchus mykiss),* as well as the genetic toxicity. A steelhead is an ocean-run rainbow trout, so studies on rainbow trout are relevant to salmonids living in the Columbia River. "Diesel [No. 2] doses of 40 mg/L were associated with a gradual increase in mortality over the duration of the test, and a sharp increase in the number of genes and functional groups of genes with altered expression. Exposures ≥200 mg/L of diesel resulted in 100% mortality of rainbow trout fry. Based upon dose–response curves interpolated from data for individual end points, toxicity reference values of 4-45 mg/L were determined" (p. 2658). The data trends show that gene expression begins to be affected in a smaller percentage of fish at levels as low as 4.1 mg/L (Table 2).[47]

Salmon that are exposed to pollution (such as oil and diesel fuel that may be spilled from vessels) could be at risk for pigmented salmon syndrome (PSS) and tainting. This syndrome's symptoms include discoloration from silver to yellow or red, significant gill and kidney damage, anemia, and kill the fish (p. 505-506).[48] Studies have found that fish living in water with 2 mg/L

[43] Meador, J. P., Sommers, F. C., Ylitalo, G. M., & Sloan, C. A. (2006, October). Altered growth and related physiological responses in juvenile Chinook salmon (Oncorynchus tshawytscha) from dietary exposure to polycyclic aromatic hydrocarbons (PAHs). *Canadian Journal of Fisheries and Aquatic Sciences,* 63: 2364-2376.
[44] Mos, L., Cooper, G., *et al*. (2008). Effects of Diesel on Survival, Growth, and Gene Expression in Rainbow Trout (Oncorhynchus mykiss) Fry. *Environmental Science & Technology,* Vol. 42, No. 7.
[45] Huntley, S. L., Bonnevie, N. L., & Wenning, R. J. (1995). Polycyclic Aromatic Hydrocarbon and Petroleum Hydrocarbon Contamination in Sediment from the Newark Bay Estuary, New Jersey (pp. 93-107). *Arch. Environ. Contam. Toxicol.* 28.
[46] Mos, Lizzy, Glenna Cooper, *et al*. (2008). Effects of Diesel on Survival, Growth, and Gene Expression in Rainbow Trout (Oncorhynchus mykiss) Fry. *Environmental Science & Technology*, Vol. 42, No. 7.
[47] Mos, Lizzy, Glenna Cooper, et al. (2008). Effects of Diesel on Survival, Growth, and Gene Expression in Rainbow Trout (Oncorhynchus mykiss) Fry. *Environmental Science & Technology*, Vol. 42, No. 7.
[48] Croce, B., Stagg, R. M., et al. (1997, December). Ecotoxicological Determination of Pigmented Salmon Syndrome: A Pathological Condition of Atlantic Salmon Associated with River Pollution (pp. 505-510). *Ambio*, Vol. 26, No. 8.

of diesel can develop PSS if also exposed to certain other chemicals (p. 509).[49] In addition, salmon that are exposed to 0.224 mg/L of diesel or 0.076 mg/L of crude oil become tainted (p. 260).[50] Tainted fish do not taste as good as un-tainted fish, and tainting can threaten the economic livelihood of those people in the supply chain (p. 258)[51] because customers do not wish to buy tainted fish.

The PAHs in oil and diesel are bioavailable and harmful to salmonids.[52] Other sources of PAHs besides boats and trains are "creosote wood preserving facilities, petroleum storage and refinery facilities, paint and chemical manufacturers, combined sewer overflows, and sewage treatment facilities" (p. 93).[53] The dominant PAHs found in diesel and oil are naphthalenes (p. 260).[54] PAHs that are larger than naphthalenes are less soluble in water, and can move more rapidly into some aquatic organisms. These PAHs "partition directly from crude oil to lipid rich tissues coming into contact with oil droplets."[55] Salmonids have lipid rich tissues, and are at immediate risk when in contact with undissolved oil, which could be discharged from tugs or Panamax vessels, or from locomotives via the stormwater system.

PAHs can also be absorbed through digestion, and poses a risk to juvenile Chinook salmon (and others) moving through urbanized areas when migrating to the marine waters from fresh water spawning grounds. At ingestion levels of 18 – 22 μg/day for 58 days in the lab, comparable to field measurements of in Puget Sound, another area of heavy ship traffic, juvenile Chinook salmon show signs of starvation and reduced body mass.[56] The daily dose that would starve a wild juvenile fish living in a polluted Puget Sound estuary, which may be similar to the Columbia River estuary, is estimated at 3.8 μg PAH/gram of fish/day; wild salmon in Puget

[49] Croce, B., Stagg, R. M., et al. (1997, December). Ecotoxicological Determination of Pigmented Salmon Syndrome: A Pathological Condition of Atlantic Salmon Associated with River Pollution (pp. 505-510). *Ambio*, Vol. 26, No. 8.
[50] DAVIS, H. K., MOFFAT, C. F., et al. (2002). Experimental Tainting of Marine Fish by Three Chemically Dispersed Petroleum Products, with Comparisons to the Braer Oil Spill (pp. 257–278). *Spill Science & Technology Bulletin*, Vol. 7, Nos. 5–6.
[51] DAVIS, H. K., MOFFAT, C. F., et al. (2002). Experimental Tainting of Marine Fish by Three Chemically Dispersed Petroleum Products, with Comparisons to the Braer Oil Spill (pp. 257–278). *Spill Science & Technology Bulletin*, Vol. 7, Nos. 5-6.
[52] Meador, J. P.; Sommers, F. C.; Ylitalo, G. M. & Sloan, C. A. (2006, October). Altered growth and related physiological responses in juvenile Chinook salmon (Oncorynchus tshawytscha) from dietary exposure to polycyclic aromatic hydrocarbons (PAHs). *Canadian Journal of Fisheries and Aquatic Sciences,* 63: 2364-2376.
[53] Huntley 1, S. L., Bonnevie, N. L., & Wenning, R. J. (1995). Polycyclic Aromatic Hydrocarbon and Petroleum Hydrocarbon Contamination in Sediment from the Newark Bay Estuary, New Jersey (pp. 93-107). *Arch. Environ. Contam. Toxicol.*, 28.
[54] Davis, H. K., Moffat, C. F., et al. (2002). Experimental Tainting of Marine Fish by Three Chemically Dispersed Petroleum Products, with Comparisons to the Braer Oil Spill (pp. 257-278). *Spill Science & Technology Bulletin*, Vol. 7, Nos. 5-6.
[55] Shukla, P., M. Gopalani, et al. Influence of Salinity on PAH Uptake from Water Soluble Fraction of Crude Oil in Tilapia mossambica. *Bulletin of Environmental Contamination & Toxicology* (2007) 79: 601-605.
[56] Meador, J. P.; Sommers, F. C.; Ylitalo, G. M. & Sloan, C. A. (2006, October). Altered growth and related physiological responses in juvenile Chinook salmon (Oncorynchus tshawytscha) from dietary exposure to polycyclic aromatic hydrocarbons (PAHs). *Canadian Journal of Fisheries and Aquatic Sciences,* 63: 2364-2376.

Sound have been found with about 23 µg PAH/ gram of fish/day for a 7g fish (roughly equivalent).[57]

Descriptions of diesel effects on the environment and organisms should be assumed to include a certain fraction of PAH effects as well. For example, since diesel has a density of about 900 kilograms per cubic meter, and 1,000 gallon = 3.785 cubic meters, then 1,000 gallons of diesel fuel would weigh about 3,406 kilograms. Since diesel is 9% PAH by weight, then 306 kilograms (675 pounds) of PAH (mostly naphthalene) per 1,000 gallons spilled is a reasonable estimate.

PAH absorption through direct contact with oil continues for the duration of exposure, depending on the circumstances. "This is of concern since these contaminants can bioconcentrate in tissues of organisms to factors 10–1000 times greater than in water. Fluorescing oil droplets were observed under microscope to adhere to the gills of rainbow trout (*Oncorhynchus mykiss*)… Rainbow trout was chosen [for the study] to enable comparisons with freshwater data from previous experiments across salinities within their zone of tolerance (0–15‰)."[58]

High-energy ultraviolet light (UVB) reacts with PAHs in water. Compounds such as naphthalene were found to become more toxic when exposed to UVB light (p. 983).[59] "PAHs and solar radiation can therefore interact to induce a broad range of effects in aquatic animals and plants. After co-exposure to adequate amounts of solar radiation and PAH the lethal effects are likely due to massive cellular and tissue damage that cannot be repaired at an adequate rate" (p. 984).[60]

The applicant states that 8,585 gallons of hazardous material will be theoretically spilled into the Columbia River by the operation, and that the estimate in gallons is for liquid petroleum products.[61] If 8,585 gallons of liquid fuel, such as diesel fuel, were spilled it could affect the aquatic life as a source of bioavailable PAHs and heavy metals, as well as having direct effects as sheen on the water, as described above (also see Stormwater section for potential effects of heavy metals).

If the 8,585 gallons per year of theoretically spilled material were coal (the hazardous material being transported), other effects to the aquatic ecosystem could occur. Coal has an estimated density of 1.9 g/cm^3,[62] which would equal 136,126 pounds spilled per year,

[57] Meador, J. P.; Sommers, F. C.; Ylitalo, G. M. & Sloan, C. A. (2006, October). Altered growth and related physiological responses in juvenile Chinook salmon (Oncorynchus tshawytscha) from dietary exposure to polycyclic aromatic hydrocarbons (PAHs). *Canadian Journal of Fisheries and Aquatic Sciences,* 63: 2364-2376.
[58] Ramachandran, Shahunthala D., Michael J. Sweezey, et al. Influence of salinity and fish species on PAH uptake from dispersed crude oil. *Marine Pollution Bulletin* 52 (2006) 1182–1189.
[59] Pelletier, É., Sargian, P., et al. (2006). Ecotoxicological Effects of Combined UVB and Organic Contaminants in Coastal Waters: A Review. *Photochemistry and Photobiology*, 82(4):981-993.
[60] Pelletier, É., Sargian, P., et al. (2006). Ecotoxicological Effects of Combined UVB and Organic Contaminants in Coastal Waters: A Review. *Photochemistry and Photobiology*, 82(4):981-993.
[61] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-194.
[62] Luppens, J.A., 2011, A critical review of published coal quality data from the southwestern part of the Powder River Basin, Wyoming: U.S. Geological Survey Open-File Report 2011–1148, 23 p. P. 19.

corresponding to 42.5 cubic yards of material per year (8,585 gal. = 32,498 L = 32,498,000 cm^3 x 1.9 g/cm^3 = 61,746,200 g = 61,746 kg = 136,126 pounds = 68 tons of coal; 32,498 L = 42.5 cubic yards).

Coal spillage, such as the theoretical spillage mentioned by the applicant, has been studied and determined to affect freshwater invertebrates, including invertebrates that provide food for salmonids such as those present in the Columbia River.[63] A railway accident in New York caused the discharge of several rail cars of coal to Cayuga Inlet, which remained in the water for 2-3 weeks before total removal. Cayuga Inlet is a third-order stream approximately 20-45 feet wide as it appears on air photos. The invertebrate inventory included oligochaete worms, gastropods (snails), isopods (crustaceans), insect orders Ephemoptera (mayflies), Plecoptera (stoneflies), Trichoptera (caddisflies) ("EPT," all three sensitive to pollution), Megaloptera (dobsonflies), Coleoptera (beetles), and Diptera (chironomidae). "Immediately following the coal spill (1999) there were significantly lower total invertebrate abundance and taxon richness at the site downstream than upstream of the impoundment and the coal spill (Fig. 1a and b). Abundance of total invertebrate grazers was also significantly reduced at the site downstream of the coal spill in 1999... Abundance of invertebrates in the orders especially vulnerable to turbidity (Trichoptera, Megaloptera, Ephemeroptera, and Isopoda) was also significantly reduced at the site downstream of the coal spill."[64]

The investigators proposed two possible reasons for the invertebrate decline. "The significant decline in total invertebrates and taxa richness following the coal spill with no significant effects on EPT demonstrated that the negative effects of the coal spill were not limited to the most sensitive invertebrates of the community. These effects could be attributed to two different mechanisms. First, a change in water chemistry could have caused invertebrate mortality, due to increased levels of Fe(OH)x and a decline in pH that occur when coal is added to water (Vinikour, 1979; Cherry *et al.*, 1979b; Scullion & Edwards, 1980). Second, Cherry *et al.* (1979a) reported that in some cases the physical effects of increased turbidity and smothering by the coal particles are more deleterious than the toxicity created by the coal/water mixture."[65] [author cites Vinikour, W.S., 1979, *Entomology News* 90: 203-204; Cherry, D.S., *et al* 1979b. *Journal of Fisheries Research Board Canada* 36: 1089–1096; Scullion, J. & R. W. Edwards, 1980. *Freshwater Biology* 10: 141–162; Cherry, D.S., *et al* 1979a *Hydrobiologia* 62: 257–267].

Selenium (Se) is an element that is found in coal, ranges between 0.1 - 5.3 mg/kg in coal worldwide,[66] and is toxic to fish, including bull trout (*Salvelinus confluentus*) and other salmonids.[67] One watershed level study in Canada examined Se in creeks downstream from coal

[63] Harper, M.P. and B.L. Peckarsky. Effects of pulsed and pressed disturbances on the benthic invertebrate community following a coal spill in a small stream in northeastern USA. *Hydrobiologia* (2005) 544:241-247.
[64] Harper, M.P. and B.L. Peckarsky. Effects of pulsed and pressed disturbances on the benthic invertebrate community following a coal spill in a small stream in northeastern USA. *Hydrobiologia* (2005) 544:241-247, p. 243.
[65] Harper, M.P. and B.L. Peckarsky. Effects of pulsed and pressed disturbances on the benthic invertebrate community following a coal spill in a small stream in northeastern USA. *Hydrobiologia* (2005) 544:241-247, pp. 243-4.
[66] Lucas, S.A, and J. Planner. Grounded or submerged bulk carrier: The potential for leaching of coal trace elements to seawater. *Marine Pollution Bulletin* 64 (2012) 1012-1017.
[67] Palace, V.P., C. Baron, et al. An assessment of the potential for selenium to impair reproduction in bull trout, *Salvelinus confluentus*, from an area of active coal mining. *Environmental Biology of Fishes* 70: 169-174, 2004.

mines, which likely provides a dilution effect from the mine drainage sites upstream. This study is important to consider because of the potential for coal or coal leachate discharges to the Columbia River which may be initially diluted but still accumulate to harmful levels in places.

Selenium bioconcentrates (enters from water) and bioaccumulates (enters from sediment) in aquatic primary producers (such as phytoplankton) and consumers, as well as fish,[68] and so represents a toxic threat to the entire food web. Se accumulation in wild fish is thought to occur both from dietary ingestion and direct uptake from the water, beginning in the egg stage.[69] Bull trout muscle tissue in watersheds with coal mines had Se concentrations from 0.6 - 9.4 μg/g on a wet mass basis, with 2 μg/g representing the toxicity threshold.[70]

Teratogenesis is the development of malformed organisms or growths, especially in the embryo. "A hallmark of Se toxicity is the appearance of teratogenic deformities in the progeny of exposed females that result from the deposition of Se to their eggs. Teratogenesis is restricted to the egg–larval stage of development when the larvae utilize yolks contaminated with Se (Lemly 1997a). The most common types of terata include spinal curvatures (lordosis, scoliosis, or kyphosis), missing or deformed fins, gills, opercula and eyes, as well as abnormally shaped heads and mouths (Lemly 1993b, 1997a). Other symptoms of Se poisoning include pericardial and abdominal edema, exopthalmus (bulging or protrusion of eyes), and cataracts (Lemly 1996)."[71] [author cites Lemly, A.D. 1997a, *Ecotoxicol. Environ. Safety* 37: 259–266; Lemly, A.D. 1993b, *Environ. Monitor. Assess.* 28: 83–100; Lemly, A.D. 1996, "Selenium in aquatic organisms." pp. 427–445. In: W.N. Beyer, G.H. Heinz & A.W. Redmon-Norwood (ed.) *Environmental Contaminants in Wildlife*. CRC Press, Boca Raton, FL, U.S.A.].

Marine Environment. Discharges of coal and coal dust to the Columbia River have the chance to either become deposited in the freshwater portions of the river or in the estuarine and marine areas near the mouth of the river when the Panamax ships leave the river. Some potential impacts to the downstream marine environment from the proposed project are discussed here.

The shipping of coal in Panamax ocean going vessels invites consideration of potential impacts to marine fisheries as well. Should a vessel full of coal sink in salt water, trace elements from the coal can leach into the marine environment, as a study commissioned by Xstrata Coal of Australia found.[72] Coal contains elements including selenium (Se), chromium (Cr), tin (Sn), mercury (Hg), arsenic (As), boron (B), vanadium (Va), cadmium (Cd), copper (Cu), lead (Pb), manganese (Mn), molybdenum (Mo), nickel (Ni), and zinc (Zn), which were tested for leaching. Of those elements, cadmium, copper, lead, manganese, molybdenum, nickel, and zinc leached from the coal into seawater, and copper and manganese exceeded the water quality guidelines for

[68] Palace, V.P., C. Baron, et al. An assessment of the potential for selenium to impair reproduction in bull trout, *Salvelinus confluentus*, from an area of active coal mining. *Environmental Biology of Fishes* 70: 169-174, 2004.
[69] Palace, V.P., C. Baron, et al. An assessment of the potential for selenium to impair reproduction in bull trout, *Salvelinus confluentus*, from an area of active coal mining. *Environmental Biology of Fishes* 70: 169-174, 2004.
[70] Palace, V.P., C. Baron, et al. An assessment of the potential for selenium to impair reproduction in bull trout, *Salvelinus confluentus*, from an area of active coal mining. *Environmental Biology of Fishes* 70: 169-174, 2004.
[71] Palace, V.P., C. Baron, et al. An assessment of the potential for selenium to impair reproduction in bull trout, *Salvelinus confluentus*, from an area of active coal mining. *Environmental Biology of Fishes* 70: 169-174, 2004.
[72] Lucas, S.A, and J. Planner. Grounded or submerged bulk carrier: The potential for leaching of coal trace elements to seawater. *Marine Pollution Bulletin* 64 (2012) 1012-1017.

Queensland, Australia, with final concentrations of 11 μg/L of Cu (seawater had 3 μg/L to begin) and 37 μg/L of Mn (seawater had 1.8 μg/L).[73] These levels could potentially harm listed salmonids with sufficient exposure, or be transported into sediments where they could build up over time.

Salt water may attenuate the absorption and effects of dissolved metals such as copper to some degree. According to the NOAA, regarding dissolved copper (dCu), "estuarine and nearshore salt water environments, despite their higher salinity (in part due to increased cation concentrations) and hardness may or may not confer protection against dCu-induced olfactory toxicity."[74] Impacts to salmonids in salt water environments from metals such as copper can still occur, and until more is known about the risks, it makes sense to use the same regulatory thresholds for salt water as the more sensitive fresh water, especially to protect listed species such as Chinook salmon.

The effect of coal dust from a shipping terminal has been shown to produce behavioral changes in crabs in laboratory experiments, as a Canadian government study revealed.[75] Coal dust was gathered from beneath a conveyor belt at Westshore Terminals, Roberts Bank, Canada, and mixed with sand to form an experimental substrate in tanks. After 15-31 days, Dungeness crabs were added and observed. "The burrowing reaction of the crabs differed with the four substrates. Crabs in sand (substrate D) never completely burrowed, but remained completely exposed, or with only a fraction of the rear portion of their carapace buried. The proportion of carapace buried increased with increasing amounts of coal in the substrate, so the in substrate (C) the crabs burrowed completely under the surface, with only eyes and antennae remaining visible."[76]

Dungeness crab megalopae (immatures) are prey for Chinook salmon (*Oncorhynchus tshawytscha*) in marine coastal areas. Although no Dungeness crabs can live in the freshwater ecosystem near the Port of Morrow, the change in burrowing behavior of other arthropods, such as isopods, if similarly affected by coal dust in the water, could reduce their availability as prey, and potentially affect trophic interactions in the Columbia River food web. Burrowing provides protection and likely reduces the opportunity for detection by predators. If coal dust entered the substrate of the salt and brackish portions of the Columbia River estuary where it meets the ocean, it could produce this effect on resident crabs there. Local fishermen who take Dungeness crabs near the Roberts Bank coal terminal report a darker coal-coloration of some crabs, and they find these crabs more difficult to market.[77]

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[73] Lucas, S.A, and J. Planner. Grounded or submerged bulk carrier: The potential for leaching of coal trace elements to seawater. *Marine Pollution Bulletin* 64 (2012) 1012-1017.
[74] Hecht, S.A., D.H. Baldwin, C.A. Mebane, T. Hawkes, S.J. Gross, and N.L. Scholz. 2007. An overview of sensory effects on juvenile salmonids exposed to dissolved copper: Applying a benchmark concentration approach to evaluate sublethal neurobehavioral toxicity. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-83, 39 p.
[75] Hillaby, B.A. 1981. The effects of coal dust on ventilation and oxygen consumption in the Dungeness crab, *Cancer magister. Can. Tech. Rep. Fish. Aquat. Sci.* 1033: vi + 18 p.
[76] Hillaby, B.A. 1981. The effects of coal dust on ventilation and oxygen consumption in the Dungeness crab, *Cancer magister. Can. Tech. Rep. Fish. Aquat. Sci.* 1033: vi + 18 p.; p. 12.
[77] Johnson, R. and R.M. Bustin. Coal dust dispersal around a marine coal terminal (1977-1999), British Columbia: The fate of coal dust in the marine environment. *International Journal of Coal Geology* 68 (2006) 57–69.

Conclusions. The ERD does not adequately address potential impacts from continued discharges of liquid fuels from shipping operations. The amount of fuel released annually should be estimated and reviewed for effects to aquatic life. The theoretical spillage of hazardous material should be discussed in detail, and the effects of the spillage estimated. Discharges from accidents have the potential to impact aquatic invertebrates that are part of the salmonid life cycle. Selenium pollution causes deformities in fish, and could threaten bull trout and other salmonids over time as coal dust deposits increase. Coal has been shown to leach elements into seawater, and could produce pollution harmful to aquatic life if a Panamax OCV became grounded or wrecked and allowed sea water to mix with the coal. Dungeness crab behavior and appearance could be affected by coal pollution entering marine waters. The effects of salinity may or may not confer protection to fish from dissolved copper from coal leaching.

IV. Stormwater Plan Review

The applicant states that the Port of Morrow facility will be designed with full on-site containment with no discharge anticipated, with bioswales to 25-year storm intensity standards.[78] "All stormwater and process water will be handled on site, with no discharge to the Columbia River."[79] Most stormwater designs include an overflow outlet for storms of greater intensity than the design. For example, the proposed 25-year storm system will not contain a 100-year storm event, and the excess water must go somewhere if it does not infiltrate. Generally overflows are directed to a receiving body, such as a wetland, river or stream, or to a low point in the uplands. The proposal does not include a preliminary drainage report, so the location of the overflow outlet and sub-basin sizes are unknown. LCI recommends reviewing a preliminary drainage report to better assess the potential impacts to nearby wetlands or waters that may receive stormwater from events larger than the 25-year storm.

The proposed coal storage area and conveyor system will be covered in some way, and may reduce the likelihood of stormwater interacting with the main coal stockpile. However, there will still be substantial contact of stormwater with coal before reaching the covered stockpile, which could become polluted and drain into nearby wetlands or waters.

Pollution of stormwater with coal compounds could occur while the rail cars are waiting to be unloaded. The tracks can accommodate up to two unit trains, each approximately 5,800 feet long.[80] The coal trains will require 4.8 hours to unload, but will likely be split to avoid blocking traffic and then require 12 hours to unload; each train will carry approximately 14,500 short tons (1 short ton = 2,000 lbs.) of coal,[81] for a maximum total of 29,000 tons in two trains.

[78] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 3-193.
[79] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-8.
[80] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-6.
[81] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. P. 2-11.

Since the terminal will be in operation for 24 hours per day, it is reasonable to assume that there will be a constant presence of coal-filled rail cars at the site. Those rail cars are uncovered, and precipitation will fall on the coal, drain to the bottom of the rail cars, and out of any drains or gaps in the car bottom. The large number of rail cars at the proposed terminal will likely provide an opportunity for polluted runoff to form similar to a 29,000 ton stockpile of coal.

When coal is transported, the vibrations may cause the coal chunks to break up to some degree. Coal is generally broken up mechanically at the mine, crushing larger pieces into smaller chunks prior to shipment. Coal chunks may also crack over time, as shown in the photos elsewhere in this document.[82] This cracking and breakdown exposes fresh coal surfaces to the air and increases the surface to volume ratio for a give amount of coal. When mined minerals are exposed to the air, they produce weathering effects at an accelerated rate, which may cause acid drainage and heavy metal release that impairs water quality.[83] When the coal arrives at the proposed terminal, it may have fractured during transport, and fresh surfaces may then be exposed to the air, which could pollute any precipitation draining through the rail cars. The polluted runoff could enter surface waters, or infiltrate to the groundwater table.

The Phase I Environmental Site Assessment Report states that the site has a high soil infiltration rate.[84] The stormwater design for the outdoor portion of the rail yard involves some infiltration of water to the soil via the bioswales.[85] Through infiltration via the bioswales, there is a high potential for groundwater contamination, depending on the soil properties.[86]

Coal piles are known to produce acids and dissolved metals which can run off into nearby wetlands or waters, even away from mine sites: "Analogous to mining operations, the storage of coal can also generate highly acidic, metal-rich leachate resulting from the oxidation of sulfidic ores present in coal as impurities (1, 2). Additional water quality concerns with regard to coal storage include that coal stockpiles are relatively abundant, not restricted to areas associated with mining operations, and often uncontrolled."[87] [author cites (1) Davis, E. C.; Boegly, W. J. *J. Environ. Qual.* 1981, 10, 12-133; (2) Swift, M. C. *Water Resour. Bull.* 1985, 21, 449-457].

Pollution from coal storage piles, and potentially from rail car on-site storage, can contain toxic metals that have been shown to pollute groundwater. Coal in the Powder River Basin can have the same amount of sulfur as the coal used in one water runoff study. The Wasatch coal

[82] Hossfeld, R.J. and R. Hatt. PRB Coal Degradation - Causes and Cures. Private company research accessed online at http://www.prbcoals.com/pdf/paper_archives/56538.pdf on 10/18/12.
[83] Sheldon, D., T. Hruby, P. Johnson, K. Harper, A. McMillan, T. Granger, S. Stanley, and E. Stockdale. March 2005. *Wetlands in Washington State - Volume 1: A Synthesis of the Science.* Washington State Department of Ecology. Publication #05-06-006. Olympia, WA. P. 3-33.
[84] Baird, Brad. Phase I Environmental Site Assessment Report Port of Morrow - Morrow Pacific Project Site. Anderson Perry & Associates, Inc. 2/27/2012, p. 11.
[85] Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow. Anderson Perry & Associates, Inc. Updated August 2012. Figure 3.10-4, Conceptual Bioswale Design.
[86] Anderson, M.A., P.M. Bertsch, *et al*. Interactions of Acidic Metal-Rich Coal Pile Runoff with a Subsoil. *Environ. Sci. Technol.* 1991, 25, 2038-2046.
[87] Anderson, M.A., P.M. Bertsch, et al. Interactions of Acidic Metal-Rich Coal Pile Runoff with a Subsoil. *Environ. Sci. Technol.* 1991, 25, 2038-2046.

formation in the Powder River Basin contains up to 1.5% sulfur.[88] A study at the US Department of Energy's Savannah River Site near Aiken, SC examined the soils that received runoff from a stockpile of low-sulfur (1-2%) coal,[89] similar to some of the Wasatch formation coal. The study analyzed the soils at the far end of the 1.5 hectare (3.7 acre) coal pile drainage basin by lab extraction through a column:

Table 2. Composition of the Coal Pile Runoff Used in Column Experiments[90]

Component	Conc., mg/L (except pH)		Component	Conc., mg/L
pH	2.13			
Al^{3+}	101.0		Li^{+}	0.232
Be^{2+}	0.055		Mg^{2+}	62.17
Ca^{2+}	83.62		Mn^{2+}	7.302
Co^{2+}	0.461		Na^{+}	11.52
Cr^{3+}	0.010		NI^{2+}	0.878
Cu^{2+}	0.262		H_4SiO_4	69.4
Fe^{2+}	4.70		$SO4^{2-}$	2,024
Fe^{3+}	119.5		Sr^{2+}	0.791
K^{+}	1.668		Zn^{2+}	2.392

The metals from the coal can move into and pollute the groundwater: "naturally acidic, noncarbonatic soils offer little resistance to subsurface migration of acidic, metal-rich runoff. As a result, coal stockpiles situated on such materials pose a serious threat to underlying groundwater systems."[91] If the soils on the proposed terminal site are similar to these soils, substantial pollution could occur. If other soil characteristics are present, the effects could vary from those described in this study.

The study found that the pollutants moved through the soil in different ways, and concentrated the pollution: "The development of concentration waves attendant with infiltration and migration of runoff within subsurface materials further exacerbates potential water quality problems. That is, chromatographic and precipitation-dissolution reactions result in the development and movement of metals in waves of concentrations potentially greatly exceeding initial source concentrations. Discharge of effluent meeting appropriate water quality criteria may thus produce downgradient concentrations exceeding standards and source concentrations. This phenomenon also emphasizes the need for continued research evaluating multicomponent transport processes."[92]

[88] Luppens, J.A., 2011, A critical review of published coal quality data from the southwestern part of the Powder River Basin, Wyoming: U.S. Geological Survey Open-File Report 2011–1148, p. 18.
[89] Anderson, M.A., P.M. Bertsch, et al. Interactions of Acidic Metal-Rich Coal Pile Runoff with a Subsoil. *Environ. Sci. Technol.* 1991, 25, 2038-2046.
[90] Anderson, M.A., P.M. Bertsch, et al. Interactions of Acidic Metal-Rich Coal Pile Runoff with a Subsoil. *Environ. Sci. Technol.* 1991, 25, 2038-2046.
[91] Anderson, M.A., P.M. Bertsch, et al. Interactions of Acidic Metal-Rich Coal Pile Runoff with a Subsoil. *Environ. Sci. Technol.* 1991, 25, 2038-2046.
[92] Anderson, M.A., P.M. Bertsch, et al. Interactions of Acidic Metal-Rich Coal Pile Runoff with a Subsoil. *Environ. Sci. Technol.* 1991, 25, 2038-2046.

The constant presence of coal in rail cars on the site has the potential to pollute the groundwater in high concentrations over time via the stormwater bioswale system if soil conditions allow. It is possible that the Columbia River could be contaminated with metals through a groundwater connection. A hydrogeologic investigation would show the groundwater movement patterns, and where such potentially polluted groundwater would travel, and a soil analysis would show if the conditions are similar to the concentration wave study.

Another study examined the sediment collected near a coal storage pile in detention ponds for metals, and featured a short-term storage pile of low-sulfur coal. The sediment contained 167 -233 ppm (parts per million; 1 ppm = 1 μg/g or 1 mg/kg) of lead (Pb), well above the average soil background level of 17 ppm.[93] Since the bioswales will catch stormwater that could contain similar sediments, similar pollution could build up in the bioswales over time. This study also reported lead groundwater concentrations of 62 ppb (parts per billion; 62 ppb = 62 μg/kg = 62 μg/L of water = 0.062 mg/L) in a well under the low-sulfur coal short-term storage pile, which exceeded Indiana's maximum contaminant level of 15 ppb.[94] If soil properties allow the concentration wave effect described in the previous study, then this level could become higher over time.

Metals in sediments, such as those that could collect in stormwater control systems contaminated with coal and acid drainage, are bioavailable (able to move into or onto an organism), can show bioaccumulation (concentration in organism/concentration in sediment), and bioconcentration (concentration in organism/concentration in pore water) in aquatic organisms.[95]

Freshwater macroinvertebrates such as the insect *Chironomus sp.* (Order Diptera, family Chironomidae), and worms *Branchiura sowerbyi* and *Limnodrilus claparedeianus* (Order Oligochaeta, family Tubificidae), were found to bioconcentrate aluminum, lead, chromium, manganese, iron, cobalt, nickel, copper, and zinc from coal contaminated water.[96] The chironomid bioaccumulated via ingestion[97] copper, zinc, and cadmium to levels greater than found in the sediment in which they lived, and to a lesser degree aluminum, lead, chromium, manganese, iron, cobalt, and nickel; the oligochaete bioaccumulated aluminum, lead, chromium, manganese, iron, cobalt, nickel, copper, zinc, and cadmium at levels lower than surrounding sediments.[98]

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[93] Cook, A.M, and S.J. Fritz. Environmental Impacts of Acid Leachate Derived from Coal-Storage Piles upon Groundwater. *Water, Air, and Soil Pollution* 135: 371–388, 2002, p. 383.
[94] Cook, A.M, and S.J. Fritz. Environmental Impacts of Acid Leachate Derived from Coal-Storage Piles upon Groundwater. *Water, Air, and Soil Pollution* 135: 371–388, 2002, p. 382.
[95] Lopez, D.L., E. Gierlowski-Kordesch, et al. Geochemical Mobility and Bioavailability of Heavy Metals in a Lake Affected by Acid Mine Drainage: Lake Hope, Vinton County, Ohio. *Water Air Soil Pollution* (2010) 213: 27-45.
[96] Lopez, D.L., E. Gierlowski-Kordesch, et al. Geochemical Mobility and Bioavailability of Heavy Metals in a Lake Affected by Acid Mine Drainage: Lake Hope, Vinton County, Ohio. *Water Air Soil Pollution* (2010) 213: 27-45, p. 37.
[97] Lopez, D.L., E. Gierlowski-Kordesch, et al. Geochemical Mobility and Bioavailability of Heavy Metals in a Lake Affected by Acid Mine Drainage: Lake Hope, Vinton County, Ohio. *Water Air Soil Pollution* (2010) 213: 27-45, p. 42.
[98] Lopez, D.L., E. Gierlowski-Kordesch, et al. Geochemical Mobility and Bioavailability of Heavy Metals in a Lake Affected by Acid Mine Drainage: Lake Hope, Vinton County, Ohio. *Water Air Soil Pollution* (2010) 213: 27-45, p. 37.

Stormwater and Rail Use. Another concern is the constant presence of locomotives and rail cars on the site. Rail yards can produce toxic pollution from certain activities. For example, re-fueling locomotives can result in spilled diesel fuel, rail car hookups and movement can contribute to heavy metal inputs, and maintenance activities all have the potential for creating polluted stormwater. A BNSF Railway Company rail yard in Seattle, WA contributed to stormwater pollution in this manner. That rail yard is approximately 8,000 feet long with multiple tracks, so it could conceivably contain 12,000 feet of rail cars or more.

Because of the intended heavy rail use of up to 12,000 feet of rail cars at one time at the proposed terminal, it makes sense to look at other rail operations in the Pacific Northwest to see what types and levels of pollution could be generated. In the recent past at the Balmer Railyard in Seattle, metals such as copper, zinc, and lead, as well as polycyclic aromatic hydrocarbons (PAHs) from spills and fuel residue drained into the stormwater system.

Some of the concentrations for pollutants are expressed in micrograms per liter (μg/L). One milligram per liter is equal to 1,000 micrograms per liter (1,000 μg/L = 1.0 mg/L).

BNSF submitted the following stormwater monitoring data to the Washington Department of Ecology between 2003 and 2009: zinc ranged from 125 - 1,950 μg/L (=0.125 - 1.950 mg/L), copper 81 - 522 μg/L (=0.081 - 0.522 mg/L), lead from 44.6 - 1,980 μg/L (=0.047 - 1.980 mg/L), and oil and grease as high as 38 mg/L.[99] One catch basin in an area dominated by tracks and rail car storage showed zinc levels at 1,180 μg/L (1.18 mg/L). If similar rail car storage functions occur at the proposed coal terminal, then it is possible that similar metal pollution will follow.

The combined presence of rail operations along with coal storage in open rail cars presents a potential and opportunity for pollution to surface and/or groundwater, as explained previously. Potential effects from bioavailable PAHs, zinc, copper, and lead pollution that may result from rail activities and coal are detailed below. Diesel contains PAHs, as does other forms of petroleum.[100] "The percentage of PAHs in crude oil, Bunker C oil, and No. 2 diesel oil are about 1%, 4%, and 9% by weight, respectively."[101] These diesel and oil based PAHs are bioavailable and potentially toxic to aquatic organisms.

Heavy metals include elements such as copper (Cu), zinc (Zn), and lead (Pb). The first two elements are needed in trace amounts by many organisms; lead has no biological role. Heavy metals accumulate in all levels of the food chain, and enter fish through the gills, tissue, or by ingestion. In the marine environment, where salinity has a negative association on metal uptake, animals that may be harmed by heavy metals are oysters, polychaete worms, shrimp, prawns,

[99] DMR Data for BNSF (Balmer Yard). (2003-2009). WA Department of Ecology Industrial Stormwater General Permit Discharge Monitoring Reports.
[100] Mos, L., Cooper, G., et al. (2008). Effects of Diesel on Survival, Growth, and Gene Expression in Rainbow Trout (Oncorhynchus mykiss) Fry. *Environmental Science & Technology,* Vol. 42, No. 7, p. 2657.
[101] Huntley, S. L., Bonnevie, N. L., & Wenning, R. J. (1995). Polycyclic Aromatic Hydrocarbon and Petroleum Hydrocarbon Contamination in Sediment from the Newark Bay Estuary, New Jersey (pp. 93-107). *Arch. Environ. Contam. Toxicol.* 28, p. 104.

marine snails, various crustaceans, and saline-tolerant bacteria.[102, 103] Effects of metals may be even more pronounced in freshwater environments such as the Columbia River, which lacks the protective effect of salinity.

The entire aquatic ecosystem can be affected when copper pollution harms microscopic aquatic organisms, the basis of the food chain. Copper inhibits photosynthesis in phytoplankton, and the presence of UVB light compounds the effect.[104] Copper and lead uptake in blue-green algae (cyanobacteria) also increases with exposure to UVB light, and limits the organism's ability to synthesize nitrogen.[105] This has major implications to the ecosystem, since blue-green algae are one of the few organisms that can convert airborne nitrogen (N_2) into biologically usable nitrate forms (NO_3). "Therefore, any threat to their existence will bring about an imbalance in the nitrogen status of entire ecosystems."[106]

Copper is toxic to salmonids and even amounts of copper as low as 2-3 µg/L can change a fish's smell and behavior.[107] "It is well established that waterborne Cu concentrations above 80 nmol/L (~5 µg/ L) can be toxic to the olfactory system of fishes causing reduced olfactory sensitivity and impaired behavioral responses."[108] One study found that exposure to 80 µg/L of copper for five days can kill salmonids.[109] Copper levels of 105 µg/L can reduce the critical swimming speed of salmonids,[110] and make them more vulnerable to predators. Copper can also bind to certain forms of hemoglobin in fish blood, and can destroy the red blood cell membranes.[111]

According to the NOAA, "adverse effects of dissolved copper and zinc on listed salmon occur at very low levels (values ranging from 0.18 to 2.1 µg/L in freshwater for copper [Hecht et al., 2007] and at 5.6 µg/L in freshwater for zinc [Sprague, 1968]). Adverse effects of copper

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[102] Wright, David A. Trace Metal and Major Ion Interactions in Aquatic Animals. *Marine Pollution Bulletin*, Vol. 31, Nos 1-3, pp. 8-18, 1995.
[103] Amoozegar, M.A., J. Hamedi1, et al. Effect of salinity on the tolerance to toxic metals and oxyanions in native moderately halophilic spore-forming bacilli. *World Journal of Microbiology & Biotechnology* (2005) 21: 1237–1243.
[104] Rai, Pramoda Kumar, and Lal Chand Rai. Interactive effects of UV-B and Cu on photosynthesis, uptake and metabolism of nutrients in a green alga *Chlorella vulgaris* under simulated ozone column. *J. Gen. Appl. Microbiol.*, 43, 281-288 (1997). P. 283.
[105] L.C. Rai *et al*. Interactive effects of UV-B and heavy metals (Cu and Pb) on nitrogen and phosphorus metabolism of a N2-fixing cyanobacterium *Anabaena doliolum*. *Environmental and Experimental Botany* 39 (1998) 221–231. P. 229.
[106] L.C. Rai *et al*. Interactive effects of UV-B and heavy metals (Cu and Pb) on nitrogen and phosphorus metabolism of a N2-fixing cyanobacterium *Anabaena doliolum*. *Environmental and Experimental Botany* 39 (1998) 221–231. P. 222.
[107] Green, Warren W., Reehans Mirza, *et al*. Copper Binding Dynamics and Olfactory Impairment in Fathead Minnows (*Pimephales promelas*). *Environ. Sci. Technol.* 2010, 44, 1431–1437. P. 1434.
[108] Green, Warren W., Reehans Mirza, *et al*. Copper Binding Dynamics and Olfactory Impairment in Fathead Minnows (*Pimephales promelas*). *Environ. Sci. Technol.* 2010, 44, 1431–1437. P. 1434.
[109] A. Gagnon *et al*. Effects of Cu on plasma cortisol and cortisol secretion by adrenocortical cells of rainbow trout (*Oncorhynchus mykiss*). *Aquatic Toxicology* 78 (2006) 59–65. P. 61.
[110] Waser, Wolfgang, Olga Bausheva, *et al*. The copper-induced reduction of critical swimming speed in rainbow trout (*Oncorhynchus mykiss*) is not caused by changes in gill structure. *Aquatic Toxicology* 94 (2009) 77–79. P. 78.
[111] Fedeli, Donatella, Manuel Carloni, *et al*. Oxidative damage in trout erythrocyte in response to ''in vitro" copper exposure. *Marine Environmental Research* 69 (2010) 172–177. P. 176.

include interference with fish sensory systems and important behaviors that underlie predator avoidance, juvenile growth and migratory success…adverse effects of zinc include altered behavior, blood and serum chemistry, impaired reproduction, and reduced growth" (p. 39).[112]

Zinc is absorbed by rainbow trout through the water (at 150-600 µg/L) and dietary intake (at 45 µg/gram food/fish/day).[113] "Zinc is easily bioaccumulated in stream invertebrates – an important food source for juvenile salmonids while rearing in freshwater systems. Recent studies demonstrate that fish fed diets contaminated with zinc exhibited reduced survival, growth, and increased incidence of disease (Farag et al., 1994, Balasubramanian et al., 1995)."[114]

Lead is a toxic element and bioaccumulates in aquatic species. "Apart from the natural weathering processes, Pb contamination in the environment has resulted from mining and smelting activities, Pb-containing paints, gasoline, and explosives, as well as from the disposal of municipal sewage sludges rich in Pb (Chaney and Ryan 1994). Despite measures adopted in many countries to limit Pb input to the environment, it continues to be one of the most serious global environmental biohazards."[115]

"Pb is assumed to be toxic for aquatic organisms at concentrations above 100 mg/kg of dry sediment (Environment Canada 1998). However, at a level of 30 mg/kg adverse biological effects have occasionally been observed."[116] Lead has been found in the liver and muscle of Alaskan Pacific Cod, which is caused by close proximity to ports and human activity.[117]

Lead has the potential to affect the aquatic food chain by harming a type of phytoplankton, blue-green algae, or cyanobacteria (an ancient bacterium found on land and in water). These organisms provide much of the oxygen on earth, and convert inert atmospheric nitrogen into forms usable by other organisms (nitrate, ammonia, etc.).

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[112] NOAA. (2009, July 15). Letter from Steven W. Landino to Mike Gearheard of US EPA. p. 2.
cites Hecht, S. A., Baldwin, D. H., Mebane, C. A., Hawkes, T., Gross, S. J., & Scholz, N. L. (2007). *An Overview of sensory effects on juvenile salmonids exposed to dissolved copper: Applying a benchmark concentration approach to evaluate sublethal neuro behavioral toxicity*. U.S. Department of Commer., NOAA Technical Memorandum NMFS-NWFSC-83.
cites Sprague, J. B. (1968). *Avoidance reactions of rainbow trout to zinc sulphate solutions*, Vol. 2:367-372. Water Research Pergamon Press.
[113] Sappal, Ravinder, and Collins Kamunde. Internal bioavailability of waterborne and dietary zinc in rainbow trout, Oncorhynchus mykiss: Preferential detoxification of dietary zinc. *Aquatic Toxicology* 93 (2009) 166–176. P. 167.
[114] Bowen, Lizabeth, Inge Werner, et al. Physiological and behavioral effects of zinc and temperature on coho salmon (*Oncorhynchus kisutch*). *Hydrobiologia* (2006) 559:161–168.
[115] Zutshi, Sunaina, Meenakshi Choudhary, et al. Evaluation of antioxidant defense responses to lead stress in *Hapalosiphon fontinalis-339*. *Journal of Phycology* 44, 889-896 (2008).
[116] Venturini, N., P. Muniz, et al. Macrobenthic subtidal communities in relation to sediment pollution: the phylum-level meta-analysis approach in a south-eastern coastal region of South America. *Marine Biology* (2004) 144:119-126.
[117] Burger, Joanna, Michael Gochfeld, et al. Heavy Metals in Pacific Cod (Gadus macrocephalus) from the Aleutians: Location, Age, Size, and Risk. *Journal of Toxicology and Environmental Health, Part A,* 70: 1897–1911, 2007.

When the cyanobacteria are in the presence of lead, they do not absorb nitrogen as easily; the effect is vastly compounded when ultraviolet light (UVB) is also present.[118] Since zooplankton eat phytoplankton like the cyanobacteria, the lead can move up the food chain, eventually reaching fish, birds, and marine mammals. Lead also creates a stress response in cyanobacteria, and de-activates the beneficial anti-oxidants inside the cells.[119] Another species of phytoplankton, a green algae, is harmed by lead concentrations of only 250 μg/L.[120]

Urban stormwater runoff (similar to the proposed terminal area), is known in general to have adverse effects on waters.[121] For example, much of the pollution that degrades the Puget Sound and threatens fish in that Pacific Northwest ecosystem is contained in stormwater.[122] Even the newest stormwater runoff models produce treatment systems that harm aquatic environments, especially those vegetated with a wide variety of sensitive native plants.[123, 124, 125] The extra coal-associated pollutants picked up in the proposed rail yard and terminal area makes this typically bad urban runoff even worse, and potentially toxic to fish.

Conclusions. A preliminary drainage report should be reviewed to determine the risk of discharging pollution to the environment via the stormwater system. The amount of carbonate in the soils should be determined to assess the ability of the soil to attenuate toxic leachates from the coal dust entering the infiltrating stormwater system. More detail should be given about the rail operations to estimate the pollution from the rail yard portion of the development, given the amount of pollution generated at similar sites in the Pacific Northwest. Liquid fuel runoff from storage tanks should be evaluated for environmental harm. The effects of potential pollution on the food web should be examined more closely to determine if harm to salmonids may occur.

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[118] L.C. Rai et al. Interactive effects of UV-B and heavy metals (Cu and Pb) on nitrogen and phosphorus metabolism of a N2-fixing cyanobacterium *Anabaena doliolum*. *Environmental and Experimental Botany* 39 (1998) 221–231.

[119] Zutshi, Sunaina, Meenakshi Choudhary, et al. Evaluation of antioxidant defense responses to lead stress in *Hapalosiphon fontinalis-339*. *Journal of Phycology* 44, 889-896 (2008).

[120] Pinto, Ernani, Teresa C. S. Sigaud-Kutner, et al. Heavy metal-induced oxidative stress in algae. *Journal of Phycology* 39, 1008-1018 (2003).

[121] Azous, Amanda L. and Richard G. Horner, Ed. *Wetlands and Urbanization: Implications for the Future. Final Report of the Puget Sound Wetlands and Stormwater Management Research Program.* Published by Washington State Department of Ecology, Olympia, WA; King County Water and Land Resources Division; the University of Washington, Seattle, WA. 1997.

[122] Cornwall, Warren. "The Painful Cost of Booming Growth." *The Seattle Times.* May 11, 2008. Accessed online on 02/21/11 at http://seattletimes.nwsource.com/html/localnews/2004405985_growth_stormwater20m0.html.

[123] Cornwall, Warren. "The Painful Cost of Booming Growth." *The Seattle Times.* May 11, 2008. Accessed online on 11/23/10 at http://seattletimes.nwsource.com/html/localnews/2004405985_growth_stormwater20m0.html.

[124] Azous, Amanda L. and Richard G. Horner, Ed. *Wetlands and Urbanization: Implications for the Future. Final Report of the Puget Sound Wetlands and Stormwater Management Research Program.* Published by Washington State Department of Ecology, Olympia, WA; King County Water and Land Resources Division; the University of Washington, Seattle, WA. 1997.

[125] Concerned Scientists and Engineers. Letter to Puget Sound Partnership, "Partnership Recommendations To: Improve Water Quality and Habitat by Managing Stormwater Runoff; Protect Ecosystem Biodiversity and Recover Imperiled Species; Provide Water for People, Fish and Wildlife, and the Environment." October 26, 2006. Accessed online on 02/02/10 at http://seattletimes.nwsource.com/ABPub/2008/05/10/2004406008.pdf.

V. Toxicology Report

The Environmental Review, Appendix J presents a toxicology report by Golder Associates, Inc. in the form of a literature review. In this section a closer look at the works cited reveals additional information that should be considered in determining the effects of the coal shipping operation.

The report says, "Ibeanusi et al (2003) observed metals (iron, aluminum, zinc, arsenic, cadmium, lead, and selenium) in eastern US coal storage pile runoff at concentrations above drinking water standards. The measurements were based on total metal concentrations; thus the biological availability and potential toxicity of these contaminants was not assessed" (p. 2). The Ibeanusi article mentioned is a study about how bacteria can absorb metals from coal runoff and be used to process acid mine drainage water. The Ibeanusi article says,

> "Wastewater effluents from coal pile run off are of major concern because of the acidity and presence of several dissolved metals in the waste stream. Similar to acid mine drainage (AMD), the chemical and biological reactions of pyrite in coal pile run off generate acidic minerals, which can oxidize to form sulfuric acid, ferrous sulfate and associated toxic metals... Unlike a typical AMD, in which the major metal ions are Fe^{2+} and Fe^{3+}, the coal pile runoff used in this study presented unique and complex chemical dynamics due to the prevalence of several dissolved toxic metals (Al, As, Be, Cd, Cr, Cu, Fe, Ni, Pb, Se and Zn) in the wastewater." (p. 35, 36) [126]
>
> "In Figure 1, results of the transmission electron microscopy indicated various stages of intracellular complexation of metal precipitates within the cytoplasm and cell membranes of the bacterial cells. Ultimately, the metal ions were sequestered outside the cells as metal precipitates (Figure 1e). The x-ray microanalysis of precipitates revealed the presence of most of the metals (As, Al, Cu, Cr, Fe, Pb and Zn) originally present in the wastewater (Figure 2). The presence of Ca, P, and S in Figure 2 suggested that most of the metals could possibly precipitate as metal carbonates, phosphates and sulfides." (p. 38)[127]

In the excerpts above, Ibeanusi says the metals are dissolved, in ionic form, are toxic, and that the bacteria can absorb the metals into the cell walls and cytoplasm, and that eventually the metals can be deposited outside the cells as metal precipitates. Counter to the Golder Associates report statement, the author addressed the toxic nature of the compounds, and showed that they are bioavailable to bacteria, which transform them inside the cells and deposit them outside the cells as precipitates.

Another author comments that metal ions are widely accepted to be bioavailable: "the most broadly accepted paradigm explaining the negative effect of salinity on trace metal uptake

[126] Ibeanusi, V.M., et al. Removal and Recovery of Metals from a Coal Pile Runoff. *Environmental Monitoring and Assessment* 84: 35–44, 2003.
[127] Ibeanusi, V.M., *et al.* Removal and Recovery of Metals from a Coal Pile Runoff. *Environmental Monitoring and Assessment* 84: 35–44, 2003.

assumes that the most bioavailable metal form is the free metal ion (Sunda et al., 1978; Engel & Fowler, 1979)."[128] [author cites Sunda et al., 1978, *Environ. Sci. Technol.* 12, 409-413; Engel & Fowler, 1979, *Environ. Health Perspect.* 28, 81-88]. So it seems that the dissolved metal ions found in acid mine drainage, such as in the Ibeanusi study quoted by Golder Associates, are bioavailable.

Metal leaching from coal is discussed in the Golder Associates report, which begins with a citation of a study by Cabon, *et al*, 2007[129] (p. 2), which is a study on leaching of metals from coal into seawater. Another author criticized Cabon's study, and largely dismissed the relevancy of his findings to coal transport: "Cabon *et al*. (2007) explained the leaching dynamics (for Mn in particular) as a function of the bicarbonate (HCO_3^-) system present in seawater. However the leach tests used a few grams of milled (<212 μm) coal samples in 20 mL of seawater and this is not typically representative of the top-size of exported coal in a bulk carrier."[130]

A study by Cook and Fritz (2002) that examined leaching from coal piles and the fate of the leachate is presented (p. 2), and the Golder Associates report highlights the effects of the surroundings on the chemicals emanating from the pile. The cited study concluded by saying,

> "data obtained from groundwater monitoring at Wade Utility Plant reflect a site in which the impacts of coal-pile leachate are largely ameliorated by carbonate mineral dissolution and by dilution. This is supported by near-neutral groundwater pH, minimal concentrations of metals, and limited geographic extent of sulfate contamination. However, a significant accumulation of trace metals in recharge pond sediments indicates that the site is not completely immune to the negative impacts of coal-pile leachate. Without the ameliorating effects of carbonate minerals to neutralize acid leachate and immobilize trace elements, above-ground storage of coal piles in non-carbonate terrain may be compromising the water quality of underlying aquifers."[131]

The soil and groundwater properties are important to consider, because in the absence of carbonate material, it is more likely that coal dust leachates could degrade the groundwater. It is unknown if similar soils exist at the Port of Morrow, and whether they are similar enough to ameliorate the leachate. If there is a groundwater table that absorbs polluted leachate, it will likely be transmitted to the adjacent Columbia River, where ESA-listed fish live.

Nitrogen pollution from coal in the form of ammonium (inorganic nitrogen, the NH_4+ ion, formed from ammonia, NH_3) is discussed. The Golder Associates report states, "dissolved inorganic nitrogen species can be removed from the water through a variety of processes, such as exposure to sediments and plant communities (Smith et al. 2009)" (p. 2). The study by Smith, et al. is an examination of polluted water produced from coal bed natural gas (CBNG) extraction in

[128] Wright, D.A. Trace Metal and Major Ion Interactions in Aquatic Animals. *Marine Pollution Bulletin*, Vol. 31, Nos l-3, pp. 8-18, 1995.
[129] Cabon, J.Y., *et al*. Study of trace metal leaching from coals into seawater. *Chemosphere* 69 (2007) 1100–1110.
[130] Lucas, S.A, and J. Planner. Grounded or submerged bulk carrier: The potential for leaching of coal trace elements to seawater. *Marine Pollution Bulletin* 64 (2012) 1012-1017.
[131] Cook, A.M, and S.J. Fritz. Environmental Impacts of Acid Leachate Derived from Coal-Storage Piles upon Groundwater. *Water, Air, and Soil Pollution* 135: 371–388, 2002.

the Powder River Basin of Wyoming. It describes the dynamics of dissolved inorganic nitrogen (DIN) over time and the differences in the form of nitrogen detected in tributaries to the Powder River. The study found by chance that one tributary, "trib B," showed a net removal of nitrogen:

> "The load calculations further emphasize that a substantial amount of the source ammonium N was removed during transport through the trib B channel but virtually none was removed in the longer trib C channel. This difference is attributed primarily to the presence of dense stands of grasses in the trib B channel. Nitrification, ammonium assimilation, and nitrate reduction all appear to be more active in the trib B channel."[132]

The effect described by the author is similar to nitrogen uptake in wetlands used for wastewater treatment. The study also said, "overall, it appears that the Burger Draw daily summertime contribution to the Powder River was about 23 kg of DIN in 2003 (Table 3). This load is a substantial contribution to the entire Powder River DIN load at Burger Draw."[133] "Management strategies for disposal of CBNG-produced water rarely consider downstream nitrogen effects. The results of this study clearly indicate that CBNG-associated DIN was being delivered from Burger Draw to the Powder River. The net result is an increased potential for eutrophication, though relatively little is specifically known about in-stream nitrogen cycling in this semiarid region."[134]

It is important to note that the mining water came into contact with coal, became rich in ammonium, and presents the ecological threat of eutrophication (excess nutrients) to downstream aquatic communities. If the runoff from the 29,000 tons of coal being stored in the rail cars produces the same effect, it is possible that portions of the Columbia River or other receiving bodies could experience eutrophication.

The Golder Associates report further discusses CBNG water use: "relatively low-flow (ephemeral stream) surface waters that receive coal bed-impacted water have been proposed for use as agricultural and livestock or wildlife drinking water (Jackson and Reddy 2007), suggesting negligible risk from a discrete nitrogen loading incident on a large river system" (p. 2). In other words, because the water is proposed for animal and crop use, it must be okay to dump into the Columbia River. That implication begs the question, if the coal-affected water was not safe for drinking, would it still be okay to dump it into the Columbia River?

Most of the water from the cited study is not safe for human drinking, or for aquatic life, and may become unsafe for animal and agricultural use, as the author of the study points out:

> "The most restrictive use, based solely on trace metal concentrations, is aquatic life. Most CBNG produced water samples exceeded the aquatic life criteria for Al

[132] Smith, R.L., et al. Geochemistry of Inorganic Nitrogen in Waters Released from Coal-Bed Natural Gas Production Wells in the Powder River Basin, Wyoming. *Environ. Sci. Technol.* 2009, 43, 2348–2354.
[133] Smith, R.L., et al. Geochemistry of Inorganic Nitrogen in Waters Released from Coal-Bed Natural Gas Production Wells in the Powder River Basin, Wyoming. *Environ. Sci. Technol.* 2009, 43, 2348–2354.
[134] Smith, R.L., et al. Geochemistry of Inorganic Nitrogen in Waters Released from Coal-Bed Natural Gas Production Wells in the Powder River Basin, Wyoming. *Environ. Sci. Technol.* 2009, 43, 2348–2354.

> and Cu. Based on secondary water quality standards, many CBNG outfall water samples are not suitable for human drinking water due to high Fe and Al concentrations. These results suggest that many of the CBNG produced waters across the PRB can be used for agriculture and livestock/wildlife drinking water."[135]
>
> "Mean concentrations of Al and Cu decreased over time in disposal ponds, whereas Ba, As, and B concentrations increased over time. Molybdenum concentrations remained the same in most watersheds. Most CBNG-produced waters examined were unsuitable for human drinking water and aquatic life, but were suitable for agricultural uses and livestock and wildlife drinking water. If the trace elements continue to increase and accumulate in CBNG disposal ponds, there may be a point in time when the concentrations of these trace elements could exceed standards for agricultural uses and livestock and wildlife drinking water."[136]

The Golder Associates report mentions coal dust as a source of total suspended solids (TSS), and says,

> "Fine particulates of coal dust in water could increase the general turbidity (as measured by suspended solids, or TSS), based on TSS data for runoff from coal storage areas (Tan and Coler 1986, Campbell and Devlin 1997, Curran *et al.* 2000). Clarity of water decreases with increased TSS, and elevated levels of TSS have been linked to toxic effects on aquatic organisms (depending on duration and concentration of exposure), but given the precautions proposed to minimize coal dust entering water bodies from the proposed operations, such elevated levels of TSS are not expected to occur" (p. 2-3).

The Fugitive Coal Dust Impacts section of this document addresses the coal dust risks for the proposed Port of Morrow project. The cited study by Campbell and Devlin 1997 states:

> "Coal dust can enter the marine environment around coal ports through storm water discharge, coal pile drainage run-off, and when coal dust from storage piles, transfer conveyer belts and rail cars becomes airborne and is deposited in the surrounding environment (i.e. fugitive coal dust)(Xuan and Robins, 1994). The practice of using additives, such as surfactants, in the water being used for surface wetting of coal piles can increase the solubility of hydrophobic compounds and thus their mobility in the aquatic environment (Enzminger and Ahlert, 1987). Coal dust contamination of estuarine habitat can occur around coal loading and storage terminals and hence may impinge on vital habitat for juvenile chinook salmon (*Oncorhynchus tshawytscha*)(Levings and Riddell, 1992; Macdonald *et al.*, 1988). Previous studies have shown that low tide use of habitats immediately

[135] Jackson, R.E. and K.J. Reddy. Trace Element Chemistry of Coal Bed Natural Gas Produced Water in the Powder River Basin, Wyoming. *Environ Sci Technol* Vol. 41, No. 17, 2007, 5953-5959.
[136] Jackson, R.E. and K.J. Reddy. Trace Element Chemistry of Coal Bed Natural Gas Produced Water in the Powder River Basin, Wyoming. *Environ Sci Technol* Vol. 41, No. 17, 2007, 5953-5959.

> surrounding coal ports on the British Columbia coast by juvenile Pacific salmon is extensive (Levings, 1985). Chinook salmon may be exposed to coal-dust-derived PAHs through contaminated water and via their food since chironomid larvae, a significant food source for juvenile salmon, have been shown to bioaccumulate PAHs in estuaries contaminated with coal byproducts (Dickmann *et al*., 1992). The construction and expansion of coal terminals has already exerted some pressure on the survival of some stocks of Pacific salmon since this activity has reduced the amount of suitable estuarine habitat available for juvenile salmonids (Levings, 1985 ; Levings and Riddell, 1992). The exposure of Pacific salmon to pollution is of some concern since it is one of the contributing factors implicated in the depletion of some chinook salmon stocks on the West Coast of Canada over the past decade (Rogers *et al*., 1988 and Rogers *et al*., 1989; Birtwell and Kruzynski, 1989; Servizi *et al*., 1993; Kruzynski *et al*., 1994)."[137]

The study tested juvenile Chinook salmon for genetic responses to the PAHs in coal dust:

> "It is clear that coal dust has effects on the expression of several genes in juvenile chinook salmon. It is also possible that these sublethal effects may become manifest at higher levels of biological organization. Coal byproducts and specific components found in coal dust leachate have been shown to reduce the growth rate of trout (Herbert and Richards, 1963), cause oocyte atresia and reduced ovarian growth in crayfish (Sarojini *et al*., 1995) and to promote DNA adduct formation and hepatocellular carcinoma in fish (Hendricks *et al*., 1985; Varanasi *et al*., 1986; Stein *et al*., 1990). It is known that CYP1A1 plays a role in the activation of procarcinogens and the formation of DNA adducts (Varanasi *et al*., 1986, 1989; Okey, 1990)."[138]

Campbell *et al.* also found that the fish were affected by the coal dust, and that expression of a particular gene, L5, can potentially be used as a biomarker test for PAH exposure:

> "Since L5 plays such a crucial role in ribosome biogenesis and cellular metabolism it is certainly plausible that the altered expression of this gene by contaminant exposure may ultimately have physiological consequences. The results of this study also indicate that alterations in the expression of L5 may potentially be used as a biomarker of specific PAH exposure in teleosts."[139]

The levels of coal dust TSS tested by Campbell et al. were of regulatory significance, and may apply to future conditions at the proposed Port of Morrow coal terminal:

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[137] Campbell, P. M., R. H. Devlin. Increased CYP1A1 and ribosomal protein L5 gene expression in a teleost: The response of juvenile chinook salmon to coal dust exposure. *Aquatic Toxicology* 38 (1997) 1-15.
[138] Campbell, P. M., R. H. Devlin. Increased CYP1A1 and ribosomal protein L5 gene expression in a teleost: The response of juvenile chinook salmon to coal dust exposure. *Aquatic Toxicology* 38 (1997) 1-15.
[139] Campbell, P. M., R. H. Devlin. Increased CYP1A1 and ribosomal protein L5 gene expression in a teleost: The response of juvenile chinook salmon to coal dust exposure. *Aquatic Toxicology* 38 (1997) 1-15.

> "For the 8 day exposure period a static system was utilized: the tanks were filled with sea water only or sea water containing either 60 mg L^{-1}, 200 mg L^{-1} or 500 mg L^{-1} coal dust. These concentrations were chosen since present regulations in British Columbia (Environment Canada) limit levels of suspended solids in coal terminal effluent to 60 mg L^{-1} however, consideration is presently being given to a request that allowable levels of suspended solids in coal terminal effluent be raised to 200 mg L^{-1}."[140]

The Golder Associates report later discusses the risk of PAH poisoning via coal dust, saying, "Chapman et al (1996) reviewed the available literature and found no evidence of toxicity from PAH or other constituents of coal leachate to crabs or fish" (p. 4).

However, Golder Associates cites the 1997 study by Campbell *et al*. that states an effect of PAH from coal dust leachate on gene expression in juvenile Chinook salmon, as quoted above. Campbell *et al'*s lab study showed one element of how PAH from coal dust can affect salmon without causing death. In nature, there is a lot more going on than in the lab, and sub-lethal effects can certainly compromise survival in many situations (such as copper affecting smell, but not killing the fish). Just because a fish doesn't die from an exposure in a lab, doesn't mean its survival is not adversely affected by it in the wild.

The Golder Associates report also mentions that PAHs from coal are not biologically available, as found by Deepthike *et al* (2009) (p. 4). The study by Deepthike *et al*. uses a PAH-sensitive bacterial biosensor to assess the bioavailability of PAHs in the Kulthieth Formation coal along the Alaska coast.

> "The bioreporter used here employs sensor and regulator proteins of a metabolic pathway (i.e., not an intracellular pathway for toxicity response) and exhibits increasing response with increasing analyte concentration, characteristic of chemical approaches, while reflecting the biological system dynamics, characteristic of ecotoxicological approaches." "When PAHs bind to a repressor protein, it activates transcription of the reporter gene to produce a reporter mRNA, which undergoes translation to produce EGFP, a stable variant of green fluorescent protein GFP (vide infra). Naphthalene was used for calibration, since the organism is most sensitive to naphthalene, although it also reacts to phenanthrene and some other PAHs." [141]

The authors mixed kaolinite, a solid from which naphthalene is completely bioavailable, with varying concentrations of naphthalene as a control, and then prepared test samples with Exxon Valdez crude oil (EVCO) and kaolinite, and samples with coal dust. The EVCO sample was obtained from another researcher who had collected it from the ship after it was stranded. The coal samples were collected from the field, "along a vertical section from dipping beds exposed

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[140] Campbell, P. M., R. H. Devlin. Increased CYP1A1 and ribosomal protein L5 gene expression in a teleost: The response of juvenile chinook salmon to coal dust exposure. *Aquatic Toxicology* 38 (1997) 1-15.

[141] Deepthike, H.U. et al. Unlike PAHs from Exxon Valdez Crude Oil, PAHs from Gulf of Alaska Coals are not Readily Bioavailable. *Environ. Sci. Technol.* 2009, 43, 5864–5870. Supporting information on methods and results at http://pubs.acs.org/doi/suppl/10.1021/es900734k.

on the east side of upper Tyndall Arm and from riverine coal floats (Figure 1). Exposed coal seams range from 6 cm to 1.5 m thick. Coal samples with a large PAH content range were chosen for this study."[142] The samples were analyzed for PAH levels, and reported completely in the supporting information available on the internet.

> "Naphthalene-amended kaolinite samples were prepared by spiking 1 g of kaolinite with 20 µL methanolic solutions of naphthalene at various concentrations and thoroughly mixing. Kaolinite samples amended with various concentrations of EVCO were prepared likewise by adding a weight-range of small portions of the crude oil. Coal samples were prepared by grinding and sieving (100 µm metal sieve). For coal, varying PAH concentrations were obtained by using samples having different natural PAH contents."[143]

The preparations were combined with the bioreporter bacteria, incubated, and examined for fluorescence. In conclusion, the authors found that "biological results indicate that PAHs in Icy Bay coals are unavailable (Figure 4B), and geological results support this."

There are several questions about this study that are not addressed by the authors. One is that the concentrations of PAHs found in the EVCO sample are generally one or more orders of magnitude higher than the coal samples. For example, the EVCO sample was assayed to contain 7.24×10^5 ng naphthalene /g of sample (nanograms per gram; 1 ng = 0.000000001g), but coal sample PKC-G had only 1.33×10^3 ng/g. In the few cases where the EVCO and coal samples are the same order of magnitude, the EVCO samples are several times stronger the coal samples. No details about the actual mixtures of the samples or levels of treatment are given; would the results have been different with a more concentrated form of coal-derived PAH?

Another question is whether the study is representative of realistic conditions in nature. The samples were prepared using a minimal medium (MM) with a pH of 6.8 so that the bacteria would be able to live. In nature, organisms may subject coal particles to varying pHs, for example in the gut, which in humans has a pH of 2. Organisms may also combine enzymes with the coal particles during digestion, which could differ among species. It is possible that a bacterium at room temperature in near-neutral pH media might absorb and transform compounds differently than a vertebrate with a body temperature four times higher and a pH much lower.

The authors do address the fact that PAHs may be slow to become available and not able to be detected by their study, and that those are beyond the scope of their work:

> "Due to the high chemical resistance to mass transport (release) of PAHs from the coal samples used here, the corresponding dominant desorption kinetics will be very slow, obviously much slower than the time scale of measurement employed

[142] Deepthike, H.U. et al. Unlike PAHs from Exxon Valdez Crude Oil, PAHs from Gulf of Alaska Coals are not Readily Bioavailable. *Environ. Sci. Technol.* 2009, 43, 5864–5870. Supporting information on methods and results at http://pubs.acs.org/doi/suppl/10.1021/es900734k.

[143] Deepthike, H.U. et al. Unlike PAHs from Exxon Valdez Crude Oil, PAHs from Gulf of Alaska Coals are not Readily Bioavailable. *Environ. Sci. Technol.* 2009, 43, 5864–5870. Supporting information on methods and results at http://pubs.acs.org/doi/suppl/10.1021/es900734k.

> here. We and other authors have addressed this point from many perspectives, full consideration of which is beyond the scope of the present manuscript. In brief, it is difficult to extend bioreporter studies past the time periods used here. However, most measurements of bioavailability are similarly restricted to measurement periods of a few hours or even weeks, i.e., periods equally inadequate to slow desorption (many months to years; with reference to the Valdez spill, some studies address this point of very slow desorption (13), others overlook it). One highly cited work on chemical extraction demonstrated that the bioremediable (i.e., perforce ad hoc bioaccessible) fraction of desorbing PAHs over two years is captured in the amount desorbed to Tenax over the same time frame as used in the present experiments (44)."[144]

A peer-review scientist's opinion of Deepthike *et al*'s research article is mentioned in the published version of the article: "one reviewer of this manuscript mandated mention of another possibility for the role of these coals in the environment: because of their capacity to sorb PAHs, rates of other processes of natural attenuation (photooxidation, biodegradation) could be diminished, diminishing the immediate PAH burden, but enhancing the persistence of toxic PAHs."[145] This comment illustrates that the coal can take up other PAHs from surroundings, which may be changed by radiation or biological activity, thereby potentially protecting the native coal PAH.

Finally, the authors reiterate their main point of finding, which is very specific: "bioavailable PAHs do not originate from organic-rich source rock associated with the Poul Creek and Kulthieth Formations east of Prince William Sound. EVCO represents the primary known source of bioavailable PAHs in the region."[146]

In no way do Deepthike *et al*. state or imply that all PAHs from all coal are biologically unavailable, as the Golder Associates report asserts: "therefore while coal PAH may be ingested by oysters (Bender et al 1987) or even bioaccumulated by aquatic insect larvae (Campbell and Delvin 1997), the PAH do not pose a toxicological risk to those animals, or others higher in the food chain" (p. 4). The Deepthike *et al* study was designed to answer a question about a local condition, not a world-wide chemical behavior.

A scientific article completed just prior to the Deepthike *et al* study reviewed unburnt coal PAH studies, and is also cited by Golder Associates. The authors write,

> "Coal-bound native PAH in soils and sediments have been studied to a minor extent, despite 30 years of research on PAH in the environment. Their impact on

[144] Deepthike, H.U. et al. Unlike PAHs from Exxon Valdez Crude Oil, PAHs from Gulf of Alaska Coals are not Readily Bioavailable. *Environ. Sci. Technol.* 2009, 43, 5864–5870. Supporting information on methods and results at http://pubs.acs.org/doi/suppl/10.1021/es900734k.
[145] Deepthike, H.U. et al. Unlike PAHs from Exxon Valdez Crude Oil, PAHs from Gulf of Alaska Coals are not Readily Bioavailable. *Environ. Sci. Technol.* 2009, 43, 5864–5870. Supporting information on methods and results at http://pubs.acs.org/doi/suppl/10.1021/es900734k.
[146] Deepthike, H.U. et al. Unlike PAHs from Exxon Valdez Crude Oil, PAHs from Gulf of Alaska Coals are not Readily Bioavailable. *Environ. Sci. Technol.* 2009, 43, 5864–5870. Supporting information on methods and results at http://pubs.acs.org/doi/suppl/10.1021/es900734k.

> the environment is not well understood. Unburnt hard / bituminous coal emissions from mining activity particularly impact those countries holding large coal basins... Hard coal consists of a macromolecular network phase and a mobile phase, and PAH are part of both. However, the latter phase is of special environmental interest because it is more mobile and is expected to have higher bioavailability. Aromatization of coals increases with increasing rank from sub-bituminous coal to anthracite. In coals, oil (mobile phase, including 2–6 ring PAH) is generated at low to medium hard coal rank from 0.5–1.3% Ro. In this range also maximum PAH concentrations may occur but they also depend on origin (e. g. maceral composition). naphthalene, phenanthrene, chrysene and alkylated derivatives are characteristic petrogenic PAH. To date, it is hardly possible to distinguish PAH derived from oil vs. PAH from coal. If other geosorbents such as black carbon are not present at higher levels, limited evaporation of naphthalenes compared to the greater losses in other samples may be a helpful indicator of the presence of coal... The data is presently insufficient for us to ascertain if native PAH derived from unburnt hard coal particles pose a severe risk for humans or organisms of the benthos and soil."[147]

Based on this review, the effects of unburnt coal PAHs are yet to be determined, and may or may not have negative effects on portions of the ecosystem. In such cases, especially when threatened or endangered species may be exposed to coal PAH (which some studies show has a physiological effect), it is best to err on the side of caution and prevent such exposures.

Conclusions. It is important to take a close look at toxicological research literature to assess the risks of discharging coal into the environment. The literature presented by Golder Associates shows that:

1) dissolved toxic metal ions from coal are bioavailable and transformable by bacteria;
2) carbonate-poor soils present a risk of groundwater contamination from metals leached from coal;
3) nitrogen pollution of water in contact with coal can occur, and pose a threat to water quality;
4) water in contact with coal can contain levels of aluminum, copper, and iron that are unsafe for human consumption and harmful to aquatic life;
5) surfactants used to control coal dust can increase the mobility of coal compounds into the aquatic environment;
6) coal dust contamination around coal loading terminals may impinge on vital habitat for juvenile Chinook salmon;
7) chironomid flies bioaccumulate PAHs which may become available to juvenile Chinook salmon via digestion;
8) coal terminal construction has exerted pressure on Pacific salmon by polluting estuaries;
9) pollution is implicated in depletion of some Chinook salmon stocks in Canada over the past decade;
10) PAHs in coal effect the expression of several genes in juvenile Chinook salmon;
11) coal dust leachate has been shown to reduce the growth rate of trout;

[147] Achten, C and T. Hofmann. Native polycyclic aromatic hydrocarbons (PAH) in coals - A hardly recognized source of environmental contamination. *Science of the Total Environment* 407 (2009) 2461-2473.

12) expression of gene L5 in teleost fish may potentially be used as a biomarker of PAH exposure;
13) sub-lethal effects may occur from exposure to coal constituents;
14) coal in the environment may sorb PAHs from the surroundings, which may prevent the native coal PAHs from reacting;
15) bioavailable PAHs from coal may be limited;
16) more research is needed to fully understand the biological risks of PAHs in coal.

A more detailed toxicological review should be performed, and should address the forms and reactivity of pollutants in the environment. Compounds can change in form from largely inert to bioavailable when subjected to different conditions, and if those conditions occur in the ecosystem near the proposed coal terminal, then they present a risk to organisms. When information on the effects of pollutants are lacking or imprecise, the activities producing those pollutants should be prevented because of the potential to directly or indirectly harm listed species such as Chinook salmon.

IV. Conclusions

The proposed coal terminal has the potential to release harmful substances into the environment. The coal dust generated by the operations may be much greater than discussed in the application. Impacts to fish could occur as a result of physical and chemical discharges from the proposed shipping terminal. Process water could also pose a risk, but more information is required to assess the potential for ecological harm. Stormwater could become polluted from coal in rail cars, and/or from the rail operations at the proposed terminal. The applicant's toxicology report contains information on scientific studies that has higher value when explained in greater detail.

Sincerely,

Joseph D. Leyda, MA
Professional Wetland Scientist
Certified Ecologist

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MSDS Revision Date (dd/mm/yyyy): 01/12/2013

SECTION 1 - IDENTIFICATION

Product name : **HEAVY FUEL OIL; BUNKER FUEL OIL; MARINE RESIDUAL FUEL; NO. 6 FUEL OIL, NO 5B FUEL OIL**

Product Code(s) HEAVY FUEL OIL

Product Use : High BTU, high viscosity, heavy residual fuel.

Chemical Family : Mixture.

Supplier's name and address:
Kildair Service Ltd.
92, Chemin Delangis
St-Paul de Joliette, QC, Canada
J0K 3E0

Manufacturer's name and address:
Refer to Supplier

Telephone # for general information : (450) 756-8091

24 Hours Emergency Tel. # for dangerous goods emergencies : (613) 996-6666 (CANUTEC)

SECTION 2 - HAZARDS IDENTIFICATION

Classification : WHMIS classification:
Class B3 (Combustible Liquids);
Class D2A (Materials Causing Other Toxic Effects, Very Toxic Material);
Class D2B (Materials Causing Other Toxic Effects, Toxic Material).

OSHA : This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).
Hazardoud classification :
Combustible liquid;
Acute Health Hazard;
Chronic Health Hazard.

Emergency Overview : Viscous liquid; black. Petroleum odour.
WARNING! Combustible liquid and vapour. Vapour is heavier than air and will collect in low-lying places.
Harmful if inhaled or swallowed. May be harmful if absorbed through the skin.
May cause nausea, vomiting, headache and other central nervous system effects.
May cause respiratory irritation. May cause eye and skin irritation. May cause liver and kidney damage.
Possible cancer hazard - contains material which may cause cancer.

POTENTIAL HEALTH EFFECTS

Signs and symptoms of short-term (acute) exposure

Inhalation : May cause irritation to the nose, throat and upper respiratory tract.
Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.
Irritating or noxious gases may be released during thermal decomposition. Releases: Hydrogen sulfide.
Severe respiratory irritation (from vapours or mists) is possible. Could also cause convulsions, coma, respiratory arrest and death.

Skin : May cause mild to moderate skin irritation. Prolonged contact, such as when trapped against the skin under clothing or jewelry, may be more irritating. Can be absorbed through skin. Exposure to hot material may cause thermal burns.

Eyes : May cause moderate eye irritation.

Ingestion : May cause irritation of mouth, throat, and stomach. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.

Effects of long-term (chronic) exposure : Prolonged skin contact may cause dermatisis (rash), characterized by red, dry, itching skin.
Prolonged overexposure may cause liver and kidney effects.

Carcinogenic status : Possible cancer hazard. See TOXICOLOGICAL INFORMATION, Section 11.

Additional health hazards : See TOXICOLOGICAL INFORMATION, Section 11.

Potential environmental effects : See ECOLOGICAL INFORMATION, Section 12.

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SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS #	Wt. %
Gas oil	64741-44-2	10.00 - 30.00
Distillates, petroleum, heavy straight-run	68915-96-8	10.00 - 30.00
Fuel oil, residual	68476-33-5	40.00 - 70.00
Distillates, (petroleum), light catalytic	64741-59-9	10.00 - 30.00
Clarified oils (petroleum), catalytic cracked	64741-62-4	10.00 - 30.00

SECTION 4 - FIRST AID MEASURES

Inhalation : Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only. Get medical attention.

Skin contact : Remove/Take off immediately all contaminated clothing. Wash exposed area thoroughly with soap and water for at least 15 minutes. If irritation persists, seek prompt medical attention. Treat all thermal burns with appropriate first aid measures for degree of burn. Flush with cool running water. Cover wound with sterile dressing. Get medical attention.

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists, seek prompt medical attention.

Ingestion : Seek immediate medical attention/advice. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Note for Physician : Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability :
Combustible liquid and vapour. Will ignite when exposed to heat, flame and other sources of ignition. Vapours are heavier than air and collect in confined and low-lying areas. Vapour can travel to ignition source and flash back. Product may float, and be re-ignited at the water's surface. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure.

Flammability classification (OSHA 29 CFR 1910.1200) :
Combustible Liquid Class III A.

Oxidizing properties : Not known

Explosion data: Sensitivity to mechanical impact / static discharge
: May be sensitive to static discharge. Not expected to be sensitive to mechanical impact.

Suitable extinguishing media : Dry chemical, foam, carbon dioxide and water fog. Do not use water jet, as this may spread burning material.

Special fire-fighting procedures/equipment
: Firefighters should wear proper protective equipment and self contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

Hazardous combustion products
: Carbon oxides; Sulphur oxides; Phosphorus compounds; Nitrogen oxides (NOx); Hydrogen sulfide; Hydrocarbons; Other unidentified organic compounds.

NFPA Rating : 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe

Health : 2 Flammability :2 Instability :0 Special Hazards :None

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SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions : All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Keep all other personnel upwind and away from the spill/release. Restrict access to area until completion of clean-up.

Environmental precautions : Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. For large spills, dike the area to prevent spreading.

Spill response/cleanup : Ventilate area of release. Remove all sources of ignition. Use only non-sparking tools and equipment in the clean-up process. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13). Notify the appropriate authorities as required. For a water spill: Remove from the water surface by skimming or with suitable absorbents. Notify the appropriate authorities as required.

Prohibited materials : Do not use combustible absorbents, such as sawdust.

Special spill response procedures : If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone : 1-800-424-8002). US CERCLA Reportable quantity (RQ): None reported.

SECTION 7 - HANDLING AND STORAGE

Safe Handling procedures : Use in a well ventilated area. Wear suitable protective equipment during handling. Avoid breathing vapours. Avoid contact with skin, eyes and clothing. Keep away from heat, sparks, and open flames. No sparking tools should be used. Avoid contact with incompatible materials. Ground all equipment during handling. Wash thoroughly after handling.

Storage requirements : Store in a cool, dry, well-ventilated area. Keep away from direct sunlight. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.

Incompatible materials : Acids; Bases; Strong oxidizers (e.g. Chlorine, Peroxides, etc.)

Special packaging materials : Always keep in containers made of the same materials as the supply container.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits

Ingredients	ACGIH TLV		OSHA PEL	
	TWA	STEL	PEL	STEL
Gas oil	5 mg/m³ (As 'Oil mist, mineral')	10 mg/m³ (As 'Oil mist, mineral')	5 mg/m³ (As 'Oil mist, mineral')	N/Av
Distillates, petroleum, heavy straight-run	N/Av	N/Av	N/Av	N/Av
Fuel oil, residual	5 mg/m³ (As 'Oil mist, mineral')	10 mg/m³ (As 'Oil mist, mineral')	5 mg/m³ (As 'Oil mist, mineral')	N/Av
Distillates, (petroleum), light catalytic	N/Av	N/Av	N/Av	N/Av
Clarified oils (petroleum), catalytic cracked	N/Av	N/Av	N/Av	N/Av

Note: Irritating or noxious gases may be released during thermal decomposition. Releases: Hydrogen sulfide. ACGIH TLV: 10 ppm (Hydrogen sulfide).

Ventilation and engineering measures : Use in a well ventilated area. General mechanical ventilation and local exhaust is recommended for use with this product.

Respiratory protection : Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. Advice should be sought from respiratory protection specialists.

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Skin protection : Impervious gloves must be worn when using this product. Advice should be sought from glove suppliers.

Eye / face protection : Safety glasses with side shields should be used with this product. Chemical goggles are recommended when there is a potential for splashing.

Other protective equipment : Wear a chemically resistant apron and long sleeves when dispensing, to prevent skin contact. An eyewash station and safety shower should be made available in the immediate working area.

General hygiene considerations : Avoid breathing vapour or mist. Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities.Remove soiled clothing and wash it thoroughly before reuse.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Viscous liquid	**Appearance**	black
Odour	Petroleum odour.	**Odour threshold**	N/Av
pH	N/Av		
Boiling point	Typical result : 250 to 550°C	**Specific gravity**	0.940 - 1.100 @ 15.5°C (60°F)
Melting/Freezing point	N/Av	**Coefficient of water/oil distribution**	N/Av
Vapour pressure (mmHg @ 20° C / 68° F)	< 1.0 kPa	**Solubility in water**	Insoluble.
Vapour density (Air = 1)	> 1	**Evaporation rate (n-Butyl acetate = 1)**	< 1
Volatile organic Compounds (VOC's)	N/Av	**Volatiles (% by weight)**	N/Av
Flash point	≥ 61°C (142°F)		
Flash point Method	ASTM D 93	**Auto-ignition temperature**	>300 (572°F) (estimated)
Lower flammable limit (% by vol.)	N/Av	**Upper flammable limit (% by vol.)**	N/Av
Flame Projection Length	N/Ap	**Flashback observed**	N/Ap

SECTION 10 - STABILITY AND REACTIVITY

Stability and reactivity : Stable under the recommended storage and handling conditions prescribed.
Hazardous polymerization : Will not occur.
Conditions to avoid : Avoid heat and open flame. Keep away from direct sunlight.
Materials To Avoid And Incompatibility : See Section 7 (Handling and Storage) section for further details.
Hazardous decomposition products : None known, refer to hazardous combustion products in Section 5.

SECTION 11 - TOXICOLOGICAL INFORMATION

Target organs : Eyes, skin, respiratory system, digestive system, central nervous system.
Routes of exposure : *Inhalation* : YES *Skin Absorption* : YES *Skin & Eyes* : Yes *Ingestion* : YES
Toxicological data : Product (based on similar blends):
LD50 (Rat, oral): >5000mg/kg (supplier)
LD50 (Rabbit, dermal): >2000mg/kg (supplier)
LC50 (Rat, inhalation): > 2500 mg/m³ (supplier)
See below for individual ingredient acute toxicity data.

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Ingredients	LC_{50}(4hr) inh. Rat	LD_{50} (Oral, rat)	LD_{50} (Rabbit, dermal)
Gas oil	1.72 mg/L/4H	> 5000 mg/kg	> 2000 mg/kg
Distillates, petroleum, heavy straight-run	N/Av	N/Av	N/Av
Fuel oil, residual	N/Av	N/Av	N/Av
Distillates, (petroleum), light catalytic	3400 mg/m³	3200 mg/kg	> 2000 mg/kg
Clarified oils (petroleum), catalytic cracked	N/Av	4300 mg/kg	> 2000 mg/kg

Carcinogenic status : This product contains Residual fuel oils. Residual fuel oils are classified as possibly carcinogenic to humans by IARC (Group 2B). Residual fuel oils contain polycyclic aromatic compounds (PAC's). Prolonged and/or repeated inhalation of PAC's, or skin contact with certain PAC's, has been shown to cause skin and lung cancer.

Reproductive effects : Not expected to have other reproductive effects.

Teratogenicity : Not expected to be a teratogen.

Mutagenicity : Not expected to be mutagenic in humans.

Epidemiology : Not available.

Sensitization to material : Not expected to be a skin or respiratory sensitizer.

Synergistic materials : None known or reported by the manufacturer.

Irritancy : Mild to moderate skin irritant. Moderate eye irritant.

Other important hazards : CNS depression may result from extreme exposures.

Conditions aggravated by overexposure :
: Pre-existing skin, eye and respiratory disorders.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity : No data is available on the product itself. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.

Mobility : No data is available on the product itself.

Persistence : No data is available on the product itself.

Bioaccumulation potential No data is available on the product itself.

Other Adverse Environmental effects: No data is available on the product itself.

SECTION 13 - DISPOSAL CONSIDERATIONS

Handling for Disposal : Handle waste according to recommendations in Section 7. Empty containers retain residue (liquid and/or vapour) and can be dangerous. Do not cut, weld, drill or grind on or near this container.

Methods of Disposal : Dispose of in accordance with federal, provincial and local hazardous waste laws.

RCRA : If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

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SECTION 14 - TRANSPORT INFORMATION

Regulatory Information	UN Number	Shipping Name	Class	Packing Group	Label
United States 49CFR/DOT	**NA1993**	Combustible liquid, n.o.s. [Contains : Distillates (petroleum), light catalytic]	**Combustible.**	**III**	
United States 49CFR/DOT Additional information	The above shipping description and additional information applies to U.S. Domestic ground shipments only. Not regulated for road or rail shipment if packaged in non-bulk containers (450 Litres or less each). The "label" appearing here is the placard to be used for bulk shipments.				
Canada (TDG)	None	Not regulated	Not regulated	None	
Canada (TDG) Additional information	None.				

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

TSCA : All listed ingredients appear on the Toxic Substances Control Act (TSCA) inventory.

CERCLA Reportable Quantity (RQ) (40 CFR 117.302): None reported.

SARA TITLE III : Sec. 302, Extremely Hazardous Substances, 40 CFR 355: No Extremely Hazardous Substances are present in this material.

SARA TITLE III : Sec. 311 and 312, MSDS Requirements, 40 CFR 370 Hazard Classes : Immediate (Acute) health hazard; Chronic Health Hazard; Fire Hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantitiy (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SARA TITLE III : Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This material is not subject to SARA notification requirements, since it does not contain any Toxic Chemical constituents above de minimus concentrations.

US State Right to Know Laws:

New Jersey Labeling Requirements : This product contains the following substances required to be disclosed on product labeling: Gas oil (CAS # 64741-44-2, 0-40%); Distillates, petroleum, heavy straight run (CAS # 68915-96-8, 0-50%); Fuel oil, residual (CAS # 68476-33-5, 0-70%); Distillates, (petroleum), light catalytic (CAS # 64741-59-9), 0-40%); Clarified oils (petroleum), catalytic cracked (CAS # 64741-62-4, 0-100%).

California Proposition 65 : This product contains a chemical known to the State of California to cause cancer.
This product contains : Fuel oil, residual. This product may contain trace levels of the following ingredients : Naphthalene.

Other U.S. State "Right to Know" Lists : The following chemicals are specifically listed by individual States : Fuel oil, residual (PA, RI).

International Information :

Canadian Environmental Protection Act (CEPA) information : All ingredients listed appear on the Domestic Substances List (DSL).

This product has been classifed in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

SECTION 16 - OTHER INFORMATION

HMIS Rating

*-Chronic hazard 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe

Health : *2 *Flammability* :2 *Reactivity* :0

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Legend :

ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstract Services
CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act of 1980.
CFR : Code of Federal Regulations
DOT : Department of Transportation
EPA : Environmental Protection Agency
EST : Eastern Standard Time
HMIS : Hazardous Materials Identification System
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
Inh: Inhalation
LC: Lethal Concentration
LD: Lethal Dose
N/Ap: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
OSHA: Occupational Safety and Health Administration
PA : Pennsylvania
PEL: Permissible exposure limit
RCRA : Resource Conservation and Recovery Act
RI : Rhode Island
RTECS: Registry of Toxic Effects of Chemical Substances
SARA : Superfund Amendments and Reauthorization Act
STEL: Short Term Exposure Limit
TLV: Threshold Limit Values
TWA: Time Weighted Average
TSCA: Toxic Substance Control Act
WHMIS: Workplace Hazardous Materials Identification System

References :

1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2009.
2. International Agency for Research on Cancer Monographs, searched 2009.
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases, 2009 (CHEMpendium, HSDB and RTECs).
4. Material Safety Data Sheet from manufacturer.
5. California Proposition 65 List - September 11, 2009 version.
6. US EPA Title III List of Lists - October, 2006 version.

Prepared by:
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Please direct all enquiries to Kildair Service.

Disclaimer of liability

The information in the Material Safety Data Sheet is offered for your consideration and guidance when exposed to this product. Kildair Service Ltd. expressly disclaims all expressed or implied warranties and assumes no responsibilities for the accuracy of completeness of the data contained herein. The data in this MSDS does not apply to use with any other product or in any other process.

This Material Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of Kildair Service Ltd.

Preparation Date (dd/mm/yyyy) 28/11/2007
Reviewed Date (dd/mm/yyyy) 01/12/2013
Revision No. 3

Revision Information

MSDS section updated:
9. PHYSICAL AND CHEMICAL PROPERTIES;

END OF DOCUMENT

Oregon and Washington Physicians for Social Responsibility (3327)

Kennedy/Jenks Consultants

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Source Water – Wellhead Protection Program

Section 5 of 2012 Water System Plan Update (Draft)

1 February 2012

Prepared for

City of Longview
1525 Broadway
Longview, Washington 98632

K/J Project No. 1197009*00

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List of Acronyms

Acronym	Description
ADD	Average Day Demand
bgs	below ground surface
BHWSD	Beacon Hill Water and Sewer District
City	City of Longview
Cowlitz PUD	Cowlitz County Public Utility District #1
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
GSI	GSI Water Solutions, Inc.
LMC	Longview Municipal Code
MCL	Maximum Contaminant Limit
MGD	million gallons per day
MFRWTP	Mint Farm Regional Water Treatment Plant
PCAs	potential contaminating activities
PDR	Preliminary Design Report
WAC	Washington Administrative Code
WHPP	Wellhead Protection Plan
WHPA	Wellhead Protection Area
WSP	City of Longview Water System Plan Update 2012

Section 5: Source Water – Wellhead Protection Program

This report discusses the City of Longview's (City's) new source of supply and summarizes the aquifer characteristics and the City's Wellhead Protection Program. The Mint Farm Wellfield and Mint Farm Regional Water Treatment Plant (MFRWTP) are scheduled to begin producing drinking water for the City and Beacon Hill Water and Sewer District (BHWSD) in late 2012. Various studies were conducted and reports generated to determine the feasibility of the site as the sole source of supply from hydrogeologic and water quality aspects. These reports are available in their entirety on the City's web site at http://www.mylongview.com/publicworks/WaterProject.html.

Information pertinent to protecting the groundwater source is contained in Part 2 of the *City of Longview Mint Farm Regional Water Treatment Plant Preliminary Design Report* (PDR), dated March 2010. More specifically, Part 2A, Hydrogeologic Characterization, Part 2B, Water Quality and Environmental Risk Assessment, contain hydrogeology information on the aquifer and the results of the Environmental Site Assessment (Phase I and II) and Human Health Risk Assessment. This information is also available on the City's website. To protect the groundwater source, and in accordance with Washington Administrative Code (WAC) 246-290-135 (3), this chapter is the City's Wellhead Protection Program.

5.1 Source Information

5.1.1 Aquifer Characteristics

The wellfield is located in the southwestern part of the City in an area known as the Mint Farm Industrial Park (see Figure 5-1) and is situated on a relatively flat floodplain at an elevation of approximately 10 feet above mean sea level. A network of dikes and drainage ditches in the Longview-Kelso basin lowers the overall shallow groundwater elevations and protects the basin from flooding during high river levels and large storm events. The wellfield site was used for agricultural operations, including mint and grass farming, until about 1975. The wellfield is located near industrial and commercial businesses, a managed wetland, and undeveloped property.

Two distinct groundwater systems are present at the wellfield site: a shallow system, and a deep system with a confining layer of silt and clay about 200 feet thick between the two systems. In the area around the wellfield site, the confining layer ranges in thickness from approximately 100 to 200 feet near the wellfield, but becomes appreciably thinner to the north and east near residential areas. The wellfield consists of four wells drilled into the deep aquifer, with plans to add two more wells as needed to meet future water demands. Figure 5-2 shows the wellfield configuration. Groundwater modeling indicates the source for the deep aquifer is the Columbia River, with a travel time to the wellfield of between 2 and 35 years. Figure 5-3 illustrates the aquifer source area and anticipated travel times. The hydrogeologic characterization of the Mint Farm area, including the deep groundwater aquifer, is provided in Hydrogeologic Characterization (Kennedy/Jenks 2010) of PDR Part 2A, Hydrogeologic Characterization (Kennedy/Jenks 2010).

The groundwater model utilized a 50-year demand scenario (2059). Based on the groundwater modeling results, the wellfield is capable of meeting and exceeding the 2059 demands.

5.1.2 Constructed Wells

Four wells have been drilled on the wellfield site (PW-1 through PW-4), with plans to add two additional wells to meet future water demands. The wells are nearly identical and drilled to a depth of between 352 and 378 feet. All of the wells have sanitary seals to at least 150 feet below ground surface (bgs). Table 5-1 below summarizes the constructed wells. Copies of the well logs for each well are included in the Water System Plan (WSP) appendices.

Table 5-1: Mint Farm Wellfield – Constructed Wells

Well Name	Ecology Well Tag#	Depth (feet bgs)	Depth to First Open Interval (feet bgs)	Sustained Yield (gpm)	Length of Pump Test	Drawdown (feet)	Drawdown of Nearest Well (feet)
PW-1	BAM420	375	230 BGS	3,918	36 days	3.3 avg.	.33 avg.
PW-2	BHF855	378	228	3982	12 hours	2.2	0
PW-3	BHF856	352	235	3987	12 hours	1.9	0
PW-4	BHF857	352	237	3950	12 hours	1.7	0

Groundwater Contamination Susceptibility Assessments have been completed for each well and are included in the WSP Appendices. In addition, a Source Approval package will be submitted to the Washington State Department of Health (DOH) in February 2012 with a request to consider these four wells as part of a wellfield, rather than regulate them as unique separate wells.

Figure 5-1: Wellfield Location Overview

Figure 5-2: Wellfield Configuration

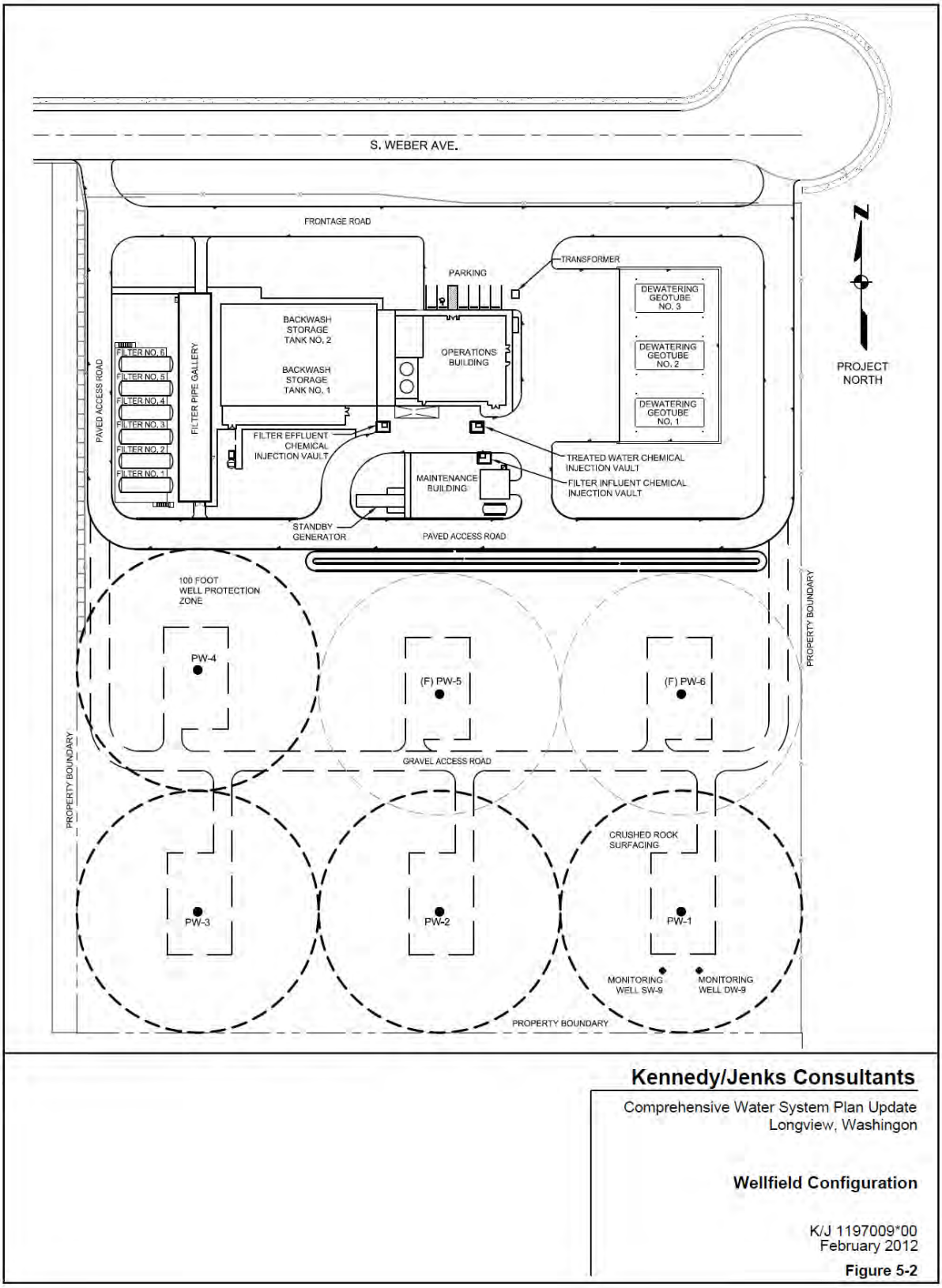
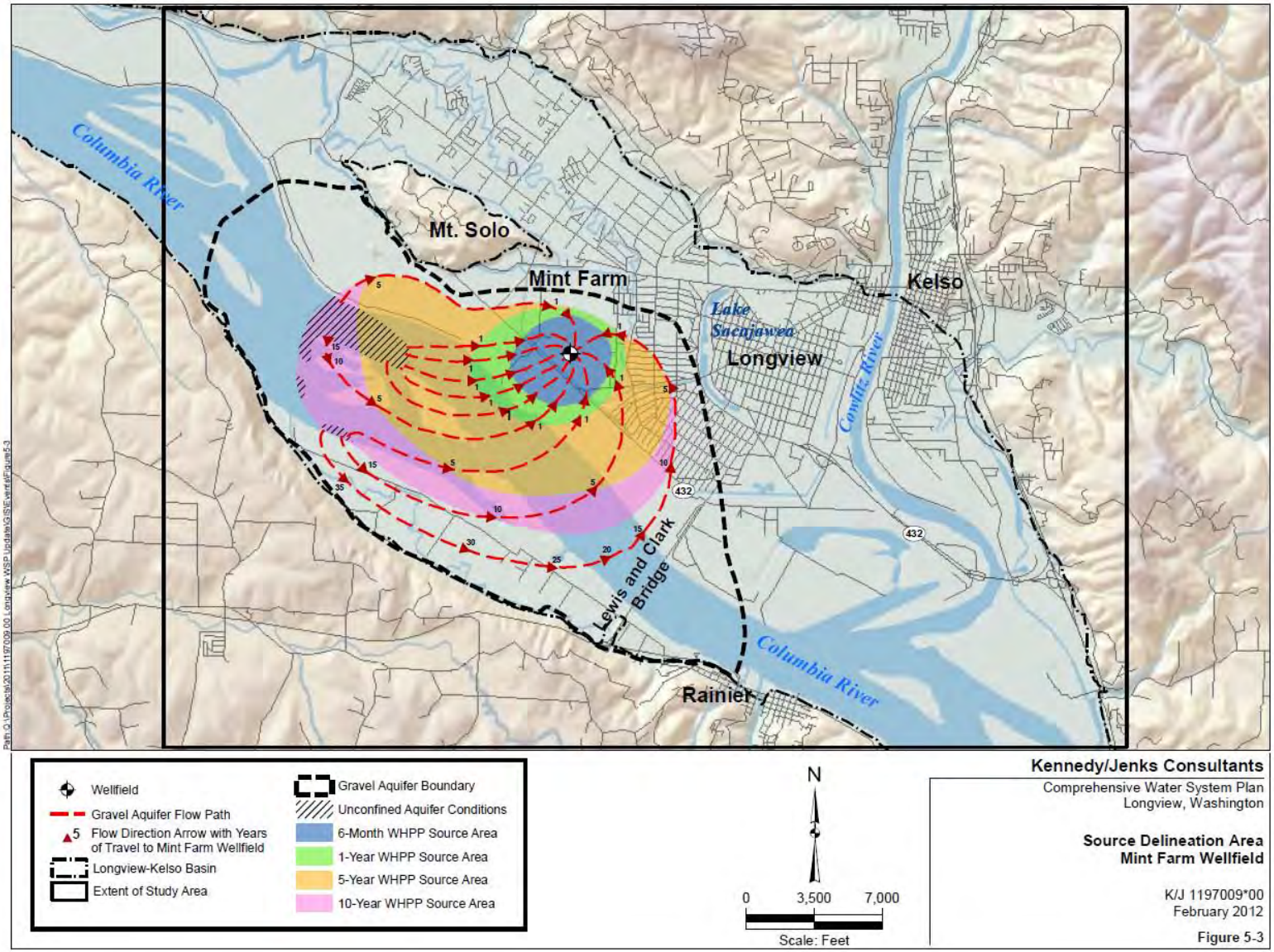


Figure 5-3: Source Delineation Area Mint Farm Wellfield



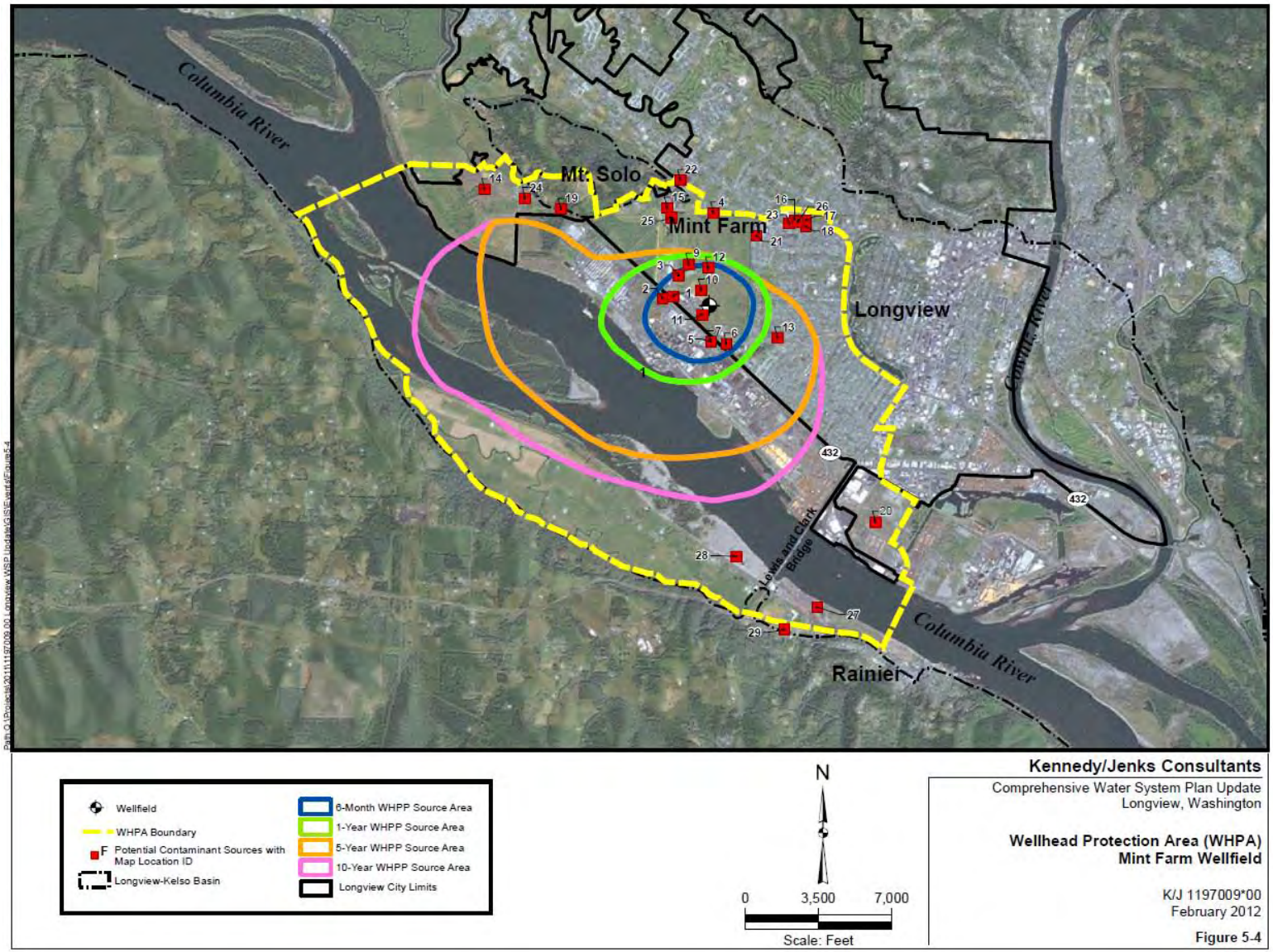
5.2 Wellhead Protection Area

The Wellhead Protection Area (WHPA) delineation was developed using the three-dimensional numerical groundwater model United States Geological Survey Code MODFLOW2000 and ADD projected at 12 million gallons per day (MGD) in 2059. Current water demand forecast suggest a 2059 ADD of about 8 MGD. As a result, the analysis is quite conservative allowing for unexpected industrial or commercial demand, or higher than forecasted growth. The groundwater flow patterns were calculated using MODPATH, a particle tracking program that uses the hydraulic gradient, hydraulic conductivity, and porosity. The model results indicate the times for water from the Columbia River to travel to the Mint Farm Wellfield varies from approximately 2 years to over 35 years along the paths shown on Figure 5-3. The City's comprehensive Wellhead Protection Plan (WHPP) comprises specific elements that include:

- A susceptibility assessment
- Delineation of wellhead protection areas
- Inventory of potential contaminant sources
- Distribution of findings
- Contingency Plans
- Appropriate spill/incident response measures.

The City intends to establish, by ordinance, a WHPA. The area is larger than the estimated 10-year time of travel in order to have boundaries that are readily recognizable in the field and on maps to facilitate implementation of various protective measures. The WHPA is shown on Figure 5-4.

Figure 5-4: Mint Farm Wellhead Protection Area



Potential threats to groundwater quality caused by 12 MGD ADD pumping at the Mint Farm wellfield were evaluated with three model scenarios:

- Forward particle tracking from potential contaminating activities (PCAs).
- Constant ground surface contaminant source at the Mint Farm.
- Constant ground source contaminant source along the Columbia River.

The results indicate that contamination from the above sources does not reach the Mint Farm production wells within a 30-year time frame (Kennedy/Jenks Consultants 2010). Figure 5-5 provides an additional illustration of the source of supply to the Mint Farm wells. Water from the Columbia River percolates through the deep water-bearing gravel to the Mint Farm and up into the wells. Therefore, the City's WHPP is focused as follows:

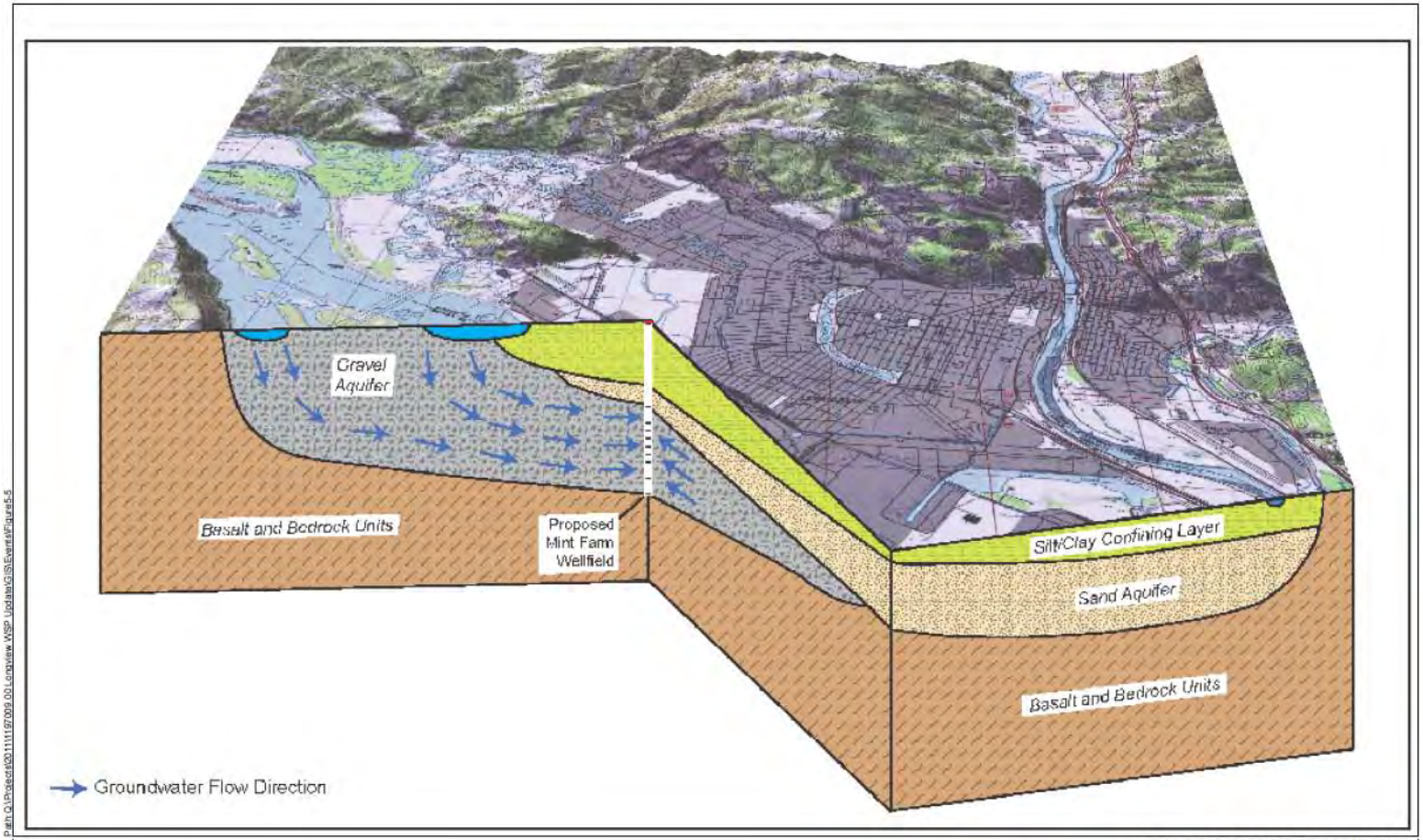
- Most spills of light non-aqueous phase liquid will float on the river surface and not impact the deep aquifer. Major spills consisting of dense non-aqueous phase liquid could sink to the river bottom and present some concern. In both cases, the compound will be flushed downstream rapidly. A method to quickly report spills in the Columbia River to the City will be developed as part of the program.
- Protective measures within the wellhead protection area will focus on preventing or mitigating the risks from construction or drilling methods that could penetrate to the deep aquifer, such as drilled pilings, piers, or other penetrations for new buildings and structures.
- The prevention of spills or surface contamination of any kind within the wellhead protection area is essential, even if the likelihood of penetration to the deep aquifer is remote.

5.2.1 Inventory of Potential Contaminants

An environmental review was completed in 2008 by GSI Water Solutions, Inc. (GSI) that identified and assessed the potential contaminants in the Mint Farm WHPA. A copy of GSI's 2008 report is available in their entirety on the City's website. This report identified 17 risks from industrial or commercial activities, three risks from contaminated shallow groundwater plumes, and risk from inadequate well seals.

Although numerous sites for potential contamination were identified, most were determined to be low risk surface contamination sites. To address the medium risk elements, the City has established a rigorous monitoring program. The shallow groundwater plumes appear to be migrating away from the wellfield towards the Columbia River. The Water Quality and Environmental Risk Assessment Part 2B of the PDR, presents a thorough discussion of water quality findings, as well as the data gathering and analyses conducted of the deep and shallow monitoring well network constructed in 2009. The City will continue to monitor the deep sentry wells for early detection purposes. As noted previously, the Longview MODFLOW Model did not identify any complete pathways between potential contamination activities in the Mint Farm or neighboring industrial areas and the deep groundwater aquifer.

Figure 5-5: Groundwater Flowpaths to Mint Farm Wellfield



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Comprehensive Water System Plan Update
Longview, Washington

Groundwater Flowpaths to Mint Farm Wellfield

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Figure 5-5

Spills, leaks, or discharges of potential contaminants on or near the surface will not directly impact the deeper aquifer. However, these sources of contamination may enter the Columbia River through either the shallow aquifer or the drainage canals. The tremendous flow of the Columbia River, as well as the fact that the recharge area is at the bottom of the river, minimizes the potential threat presented by the shallow aquifer or drainage canals in this area.

A list of the potential sources of contamination within and near the 10-year time of travel is included in Table 5-2. Table 5-2 summarizes the information as reported in GSI's report and the Phase I and II Environmental Site Assessment. These sites are located on Figure 5-4. The City will notify all owners and operators of these sites of the wellfield and request their assistance in protecting the aquifer. Regulatory agencies and local governments (regulatory and first responders) involved with the areas within the WHPP will also be notified. A copy of these letters and their lists recipients are included in the WSP appendices.

The following is a list of governmental agencies that will be notified of the WHPA boundary and potential contaminant inventory:

- Washington State Department of Ecology
- Washington State Department of Health
- Oregon State Department of Environmental Quality
- Cowlitz County
- Columbia County (Oregon)
- US Environmental Protection Agency
- Washington State Department of Fish and Wildlife
- Oregon State Department of Fish & Wildlife
- US Army Corps of Engineers
- US Coast Guard
- Port of Longview
- Port of St. Helens
- National Oceanic and Atmospheric Administration Fisheries / National Marine Fisheries Service
- Washington Department of Emergency Management
- City of Rainier
- Columbia River Fire District.

Table 5-2: List of Potential Sources of Contamination

Company/Business	Site Name	Map Location	Latitude/Longitude	Time of Travel Zone
Moeller Land/Cattle Co.	Flex Foam Facility	1	46.1375/122.98583	6-Month
Bonneville Power Administration	Longview Substation	2	46.13716/-122.98786	6-Month
Mint Farm Energy Ctr, LLC	Energy Plant	3	48.14028/122.985	6-Month
Weyerhaeuser	Mint Farm	4	46 8 54.83/122 58 43.62	6-month
Weyerhaeuser	HG Chlor Alkali	5	46.13171/-122.9785	6-Month
Washington Way Market	Washington Way Market	6	46.1315/-122.97555	6-Month
Weyerhaeuser	Plywood Mill	7	46.13172/-122.9785	6-Month
Columbia/Cowlitz Railway	Rail Spur	8	N/A	6-Month
Woodinville Lumber, Inc.	Tri County Truss	9	46 8 30.38/122 58 59.29	6-Month
Solvay Interox	Solvay Interox Facility	10	46 8 18.39/122 58 50.35	6-Month
HASA (J Huber)	HASA (J Huber)	11	46 8 6.70/122 58 49.03	6-Month
Millennium Bulk Terminals	Millennium Bulk Terminals - Longview	12	46 8 29/122 59 46	5-Year
Millers Market	Millers Market	13	46.13252/-122.96597	5-Year
Unknown	Unknown Diesel Spill	14	46 9 2.63/123 1 19.23	Buffer area
Longview Auto Wrecking	Longview Auto Wrecking	15	46 8 56.501/122 59 15	Buffer area
Fred Meyer	Fred Meyer Fuel Stop	16	46 08 52.43/-122 57 48.31	Buffer area
Safeway	Safeway Fuel Station	17	46 8 52.71 / 122 57 40.93	Buffer area
Rio West Restaurant	Rio West Restaurant	18	46 8 49.898/122 57 40.702	Buffer area
McCall Trucking	McCall Trucking	19	46.14846/-123.00753	Buffer area
Port of Longview	Port of Longview	20	46 6 31.63/122 56 47.33	Buffer area
US EPA Dorothy Ave Mercury Spill	US EPA Dorothy Ave Mercury Spill	21	46 8 44.84/122 58 13.99	Buffer area
Longview School District	Longview School District 122	22	46.15274/-122.98525	Buffer area
Shell/Texaco Station	Shell/Texaco Station	23	46 8 51/122 57 52	Buffer area
Robert Radakovich Sr/ Port of Longview	Mt. Solo Landfill	24	46 8 59.04/123 00 51.68	Buffer area
Toyocom	Toyocom Devices of America	25	46 8 52.07/122 59 11.81	Buffer area
Ocean Beach Chevron	Ocean Beach Chevron	26	46 8 52/122 57 46	Buffer area
Teevin Brothers	Teevin Brothers	27	46.097391/122.956932	Buffer area
US Gypsum Co	US Gypsum Co	28	46 06 13.52/122 58 20.80	Buffer area
Rainer Shell	Sheel Gas Station	29	46.094352/122.963032	Buffer area

5.2.1.1 Existing Deep Aquifer Wells

Weyerhaeuser Company, who has three deep gravel aquifer wells, has been contacted and is considering decommissioning these wells. Millennium Bulk Terminals has been contacted to initiate plans for protection of their nine deep wells. At this time, Millennium Bulk Terminals does not have plans to abandon any of their wells and is restoring all nine wells to operating condition. Puget Sound Energy has two deep wells, constructed in 2001 and 2002 using modern construction methods that pose little risk of contamination to the City's wellfield.

5.2.2 Management Strategies and Implementation

The City's approach to management and implementation of the WHPP, a combination of ordinances and a monitoring well network, are discussed below.

5.2.2.1 Ordinances

Chapter 17 of the Longview Municipal Code (LMC) deals with the environment and includes sections on Critical Areas, stormwater management, and general environmental protection. This chapter of the LMC was expanded to include protection of the municipal water source aquifer. The water supply protection ordinance (Ord. No. 3127) was first adopted on 11 February 2010 to prohibit the practice of hydraulic fracturing at all locations within or beneath the corporate city limits. The ordinance also prohibits "any other activity that has the potential to significantly reduce the Mint Farm Aquifer recharge, aquifer flow, or aquifer water quality and threaten the use of the Mint Farm Aquifer as a municipal water supply."

The City intends to adopt a new ordinance further amending the LMC to establish the WHPA boundary and to provide additional detail on regulations to protect the aquifer. A copy of the draft ordinance is included in the WSP appendices.

5.2.2.2 Outside of Longview Jurisdiction

For areas within the WHPA but outside of Longview's jurisdiction, the City has approached Cowlitz County regarding their adoption of a wellhead protection ordinance that is similar to the City's. The City has also contacted Weyerhaeuser Company and Millennium Bulk Terminals regarding the potential for executing wellhead protection agreements if the County does not adopt a wellhead protection ordinance. Additionally, the City will contact the City of Rainier and Columbia County in Oregon regarding adoption of wellhead protection ordinances similar to the City's, to address that portion of the WHPA that lies within Oregon.

5.2.2.3 Monitoring Wells

The City is committed to continuing to sample select deep monitoring wells located along Industrial Way, including DW-1, DW-2, DW-5, DW-6, DW-7, and DW-9 on a semi-annual basis. These wells are within the primary flow path from the river to the Mint Farm and analyses of these wells will provide an early warning system to the City if an unanticipated contamination of the deep aquifer occurs. The wellhead protection program will utilize monitoring wells as an early identification of potential adverse changes in groundwater quality within the target aquifer. The City is considering additional monitoring wells and has contacted Weyerhaeuser Company and Millennium Bulk Terminals regarding the potential to install additional monitoring wells on their property.

Figure 5-6: Groundwater Monitoring Well Sites

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Comprehensive Water System Plan Update
Longview, Washington

Groundwater Monitoring Well Sites
February 2012

Figure 5-6

5.2.3 Contingency Plan

Due to the characteristics of the deep aquifer, it is very unlikely that one or more wells would be impacted by a contamination event requiring immediate suspension of its use. A more likely scenario would be detection of a slight quantity of a drinking water contaminant in a monitoring well and/or production well.

If contamination is detected in a monitoring well or production well, the City will initiate a quality assurance/quality control review of the sampling and handling procedures and collect a confirmation sample as soon as possible. If the presence of a contaminant is confirmed, the City will consult with the DOH, and consideration should be given to sampling other wells in the wellfield, selected monitoring wells, and the treated water. Even if a drinking water Maximum Contaminant Limit (MCL) (the level at which consumers' health may be impacted after a prolonged exposure) is exceeded, the City will likely have time to address the problem without impacting public health.

If a production well, monitoring well or nearby deep aquifer well is impacted by contamination, the City will immediately notify BHWSD and the City of Kelso, water purveyors supplied by the MFRWTP. Similarly, the City will work with Ecology and the DOH to report the contamination and locate its source.

Depending on the level and extent of contamination, various operational options will be considered including:

- Using other wells in the wellfield
- Alternating use of individual wells
- Changing the length of time that each well is in operation
- Reducing water system demands by implementing the City's Water Shortage Response Plan ordinance (LMC 15.74) as discussed in Section 4.5.1
- Obtaining water from the City of Kelso through their intertie
- Equipping the City's Prudential Boulevard Well
- Obtaining water from another approved source of water
- Depending on the level of contamination, the City will consider providing treatment of water from one or more production wells. Treating and lowering the contaminant level in one production well may allow the City to blend this water with water containing a higher concentration of contaminant, to produce water containing a reduced average level. Blending is a common treatment technique for chemical contamination of wells.

5.2.4 Spill and Incident Response Planning

As previously stated, a spill or other contamination of the soil or shallow groundwater likely will not directly affect the deep aquifer. However, because of the potential for this contamination to migrate to the Consolidated Diking Improvement District's drainage ditches and/or Columbia River, the City must be notified of any event that may cause contamination of shallow groundwater or the drainage system. Current first response containment procedures should be followed rather than washing or flushing the spill into the ground or drainage system. Likewise,

the City should be notified of spills or discharges to the river that are not permitted or that exceed permit levels.

As stated above, the City will notify all first responders and governmental agencies with jurisdiction in the WHPA and requested their assistance in protecting the quality of the deep gravel aquifer. In addition to the list of agencies to be notified, the following entities will be requested to report spills to the City's emergency telephone operator:

- Cowlitz County Com Center (Dispatch)
- Longview Fire Department
- Longview Police Department
- Cowlitz 2 Fire & Rescue
- Washington State Patrol
- Cowlitz County Sheriff
- U.S. Coast Guard
- U.S. Army Corps of Engineers
- Columbia River Fire
- Port of Longview
- Port of St. Helens
- City of Rainier Police Department
- Washington State Department of Ecology
- U.S. Environmental Protection Agency
- Cowlitz Clean Sweep
- PNE Corporation
- Weyerhaeuser Company
- Longview Fibre Paper & Packaging Inc.

The City will also maintain an awareness of new developments or discharges to the Columbia River and monitor permit renewals and discharges on nearby upstream tributary rivers.

Oregon and Washington Physicians for Social Responsibility (3327)

MAP OF LONGVIEW SCHOOLS

1. Broadway School – 1410 Eighth Avenue
2. Cascade Middle School – 2821 Parkview Drive
3. Columbia Heights Elementary – 2820 Parkview Drive
4. Columbia Valley Gardens Elementary – 2644 30th Avenue
5. Kessler Elementary – 1902 E. Kessler Blvd.
6. Mark Morris High School – 1602 Mark Morris Court
7. Mint Valley Elementary – 2745 39th Avenue
8. Monticello Middle School – 1225 28th Avenue
9. Mt. Solo Middle School – 5300 Mt. Solo Road
10. Northlake Elementary – 2210 Olympia Way
11. Olympic Elementary – 1324 30th Avenue
12. R.A. Long High School – 2903 Nichols Blvd.
On Track Academy – 2742 Harding St

Portland Detail

8/2014

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Oregon PSR ARSENIC AND PUBLIC HEALTH REFERENCES

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Trans-Pacific transport of mercury

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[1] We examine the trans-Pacific transport of mercury with a global chemical transport model. Using existing anthropogenic inventories, the model underestimates the observed Hg/CO ratio in Asian long-range transport events observed at ground-based sites in Okinawa, Japan and Mount Bachelor, Oregon, by 18–26%. This is in contrast with previous studies that inferred a factor of two underestimate in Asian anthropogenic emissions. We find that mercury from land emissions and re-emissions, which are largely colocated with anthropogenic emissions, account for a significant fraction of the observed Hg/CO ratio. Increasing Asian anthropogenic Hg^0 emissions by 50% while holding land emissions constant, or further increasing anthropogenic emissions while decreasing land emissions, corrects the remaining model bias in the Hg/CO ratio. We thus find that a total Asian source of 1260–1470 Mg/a Hg^0 is consistent with observations. Hg^0 emissions from Asia are transported northeastward across the Pacific, similar to CO. Asian anthropogenic emissions of mercury contribute 18% to springtime Hg^0 concentrations at Mount Bachelor. Asian RGM is not directly transported to North America in the lower troposphere but contributes to a well-mixed pool at high altitude. Asian and North American sources each contribute approximately 25% to deposition to the United States, with Asian anthropogenic sources contributing 14% and North American anthropogenic sources contributing 16%.

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1. Introduction

[2] Anthropogenic emissions have caused a factor of 3 increase in the atmospheric mercury burden since preindustrial times [*Mason and Sheu*, 2002], posing a threat to human health and wildlife. Asian emissions increased rapidly in the early 1990s, and in 2000 accounted for 54% of global anthropogenic emissions [*Pacyna et al.*, 2006]. European and North American emissions decreased over the same time period.

[3] With an atmospheric lifetime of several months, elemental mercury (Hg^0) undergoes global atmospheric transport. Global modeling studies indicate that 21–24% of mercury deposition to North America is of Asian origin, compared to 30–33% of North American origin [*Seigneur et al.*, 2004; *Travnikov*, 2005].

[4] Several observational studies have detected long-range transport of mercury from Asia. Aircraft measurements during the ACE-Asia campaign found mercury to be well correlated with other pollutants in plumes over the western Pacific Ocean [*Friedli et al.*, 2004]. At a ground-based site in Okinawa, Japan, *Jaffe et al.* [2005] measured elevated Hg^0 and CO concentrations during episodes of Asian outflow. During the INTEX-B campaign, *Talbot et al.* [2007] observed mercury in Asian plumes on flights over the Pacific. In North America, observations from Mount Bachelor Observatory, Oregon (MBO) identified episodes of Asian long-range transport with high Hg^0 concentrations [*Jaffe et al.*, 2005; *Weiss-Penzias et al.*, 2006]. The Hg^0/CO enhancement ratio during Asian transport events, which represents the relative increase of the two species over their respective background levels, is expected to reflect the relative emissions of Hg^0 and CO. However, the Okinawa Hg^0/CO enhancement ratio of 0.0056 ng/m^3/ppbv observed during Asian long-range transport events is almost twice the emission ratio from the current anthropogenic mercury and CO inventories [*Jaffe et al.*, 2005]. *Friedli et al.* [2004] and *Weiss-Penzias et al.* [2007] reported similarly enhanced ratios for long-range transport events observed during ACE-Asia and at MBO, respectively. *Jaffe et al.* [2005] proposed three possible explanations for this discrepancy: an underestimate of Asian anthropogenic Hg^0 emissions, a contribution from Asian land emissions, or production of Hg^0 from reactive gaseous mercury (RGM) emissions during transport.

[5] In this paper, we use the GEOS-Chem global chemical transport model to interpret mercury and CO observations at Okinawa, Japan and Mount Bachelor, Oregon. We

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use the model to improve constraints on the magnitude of Asian mercury emissions and their contribution to deposition over North America.

2. Observations and Model

[6] The Hedo Station, Okinawa (HSO) is located at 26.8°N, 128.2°E, 60 m above sea level. It is remote from any major cities and in the pathway of East Asian outflow. *Jaffe et al.* [2005] conducted a campaign at Okinawa from 23 March to 2 May 2004, measuring concentrations of mercury species (Hg^0, RGM, and particulate mercury) and CO.

[7] MBO is a mountain top site located at 44.0°N, 121.7°W, 2.8 km above sea level. It receives both free-tropospheric and boundary layer air masses and experiences a diurnal cycle of upslope and downslope flow [*Weiss-Penzias et al.*, 2006]. *Weiss-Penzias et al.* [2006, 2007] describe measurements of total airborne mercury (TAM = Hg^0 + RGM + particulate mercury), CO, and other species at MBO from 28 March 2004 until 30 September 2005. From 30 April to 31 August 2005, *Swartzendruber et al.* [2006] measured speciated mercury (Hg^0, RGM, and particulate mercury) at MBO.

[8] We analyze these observations with the GEOS-Chem global tropospheric chemistry model [*Bey et al.*, 2001] version 7-04-05 (http://www.as.harvard.edu/chemistry/trop/geos/). The model is driven by assimilated meteorology from the NASA Global Modeling and Assimilation Office (GMAO). After a spin-up period to reach steady state, we run the model for 2004 using the GEOS-4 meteorological fields. The model has 2° latitude by 2.5° longitude horizontal resolution and 30 hybrid pressure-sigma layers. For the grid boxes corresponding to Okinawa and MBO, we extract hourly output from the model.

[9] We perform a CO simulation [*Duncan et al.*, 2007], which includes emissions from fossil fuel, biofuel, and climatological biomass burning, as well as a photochemical source from oxidation of methane and biogenic volatile organic compounds (BVOCs). The CO simulation has been evaluated extensively in other studies [e.g., *Heald et al.*, 2003; *Palmer et al.*, 2003; *Liang et al.*, 2004; *Duncan et al.*, 2007].

[10] We also perform a mercury simulation, with tracers for Hg^0, divalent mercury (Hg^{II}), and particulate mercury (Hg^P) [*Selin et al.*, 2007]. We treat the Hg^{II} tracer as comparable to RGM measurements. In the atmosphere, Hg^0 is oxidized to Hg^{II} by ozone and OH, and in cloudy regions Hg^{II} can be reduced back to Hg^0. Hg^{II} is lost through wet and dry deposition. In the rest of the paper we will refer to RGM as Hg^{II}. The model includes emission, transport, and deposition of Hg^P, but does not currently include Hg^P chemistry. The atmospheric mercury model is fully coupled to a slab model of the ocean mixed layer [*Strode et al.*, 2007]. Mercury entering the ocean mixed layer through deposition or oceanic mixing can be converted in the ocean to elemental mercury and then emitted to the atmosphere through gas-exchange, or it can be lost to the deep ocean through mixing and sinking on particles.

[11] The mercury simulation includes emissions from anthropogenic sources [*Pacyna et al.*, 2006; *Wilson et al.*, 2006], biomass burning, and natural emissions plus re-emissions from land and ocean. Globally, the model includes 2200 Mg a^{-1} total mercury from anthropogenic sources, 2000 Mg a^{-1} from land emissions and re-emissions, 520 Mg a^{-1} from biomass burning, and 2970 Mg a^{-1} ocean emissions. Mercury from biomass burning is scaled to climatological biomass burning emissions of CO [*Duncan et al.*, 2003], using a Hg^0/CO emission ratio of 1.5×10^{-7} mol/mol [*Slemr et al.*, 2006b]. Land emissions are divided into a natural (geogenic) component of 500 Mg a^{-1}, distributed in regions with geologic deposits, and a re-emission component of 1500 Mg a^{-1}, distributed according to the pattern of deposition. Ocean emissions are a function of deposition, radiation, biological productivity, temperature, and wind speed. Land, biomass burning, and ocean emissions are all as Hg^0.

[12] Figure 1 shows the distribution of anthropogenic, land, and biomass burning emissions over Asia (defined here as 9°S–60°N, 65°–146°W). For this region, anthropogenic emissions are 610 Mg a^{-1} of Hg^0, 380 Mg a^{-1} of Hg^{II}, and 100 Mg a^{-1} of Hg^P. Geogenic emissions of 100 Mg a^{-1} Hg^0 are located primarily in southeast China. Land re-emissions of 310 Mg a^{-1} Hg^0 are distributed throughout the region, with large emissions from southeast China and India. Large anthropogenic emissions and high deposition rates drive the elevated re-emissions in China. India has lower anthropogenic emissions than China, but its land re-emissions are elevated because high precipitation combined with the elevated rate of Hg^{II} formation in the tropics causes high deposition to this area. Biomass burning accounts for 150 Mg a^{-1} Hg^0, with large emissions from Southeast Asia and India peaking in March and April and emissions from Siberian boreal forest fires peaking in July and August. This region also includes ocean emissions of 360 Mg a^{-1} Hg^0.

[13] Both CO and mercury tracers are tagged in the model according to their emission region and source. We consider four regions: Asia, North America, Europe, and the rest of the world. For mercury, we also tag emissions from biomass burning, land, and ocean sources. The regional land tracers include both geogenic land emissions and land re-emissions. Mercury emitted as Hg^0 that later oxidizes to Hg^{II} retains the tag of its original emission region. For example, the Asian Hg^{II} tracer contains both Hg^{II} directly emitted from Asia and Hg^{II} formed by oxidation of Asian Hg^0. Ocean emissions are tagged as primary ocean only if the mercury entered the mixed layer from the deep ocean; mercury of anthropogenic or land origin that is deposited to the ocean and then re-emitted retains its original tag. Our Asian anthropogenic mercury tracer thus includes both direct emissions from Asia and also ocean re-emission of previously deposited Asian anthropogenic mercury. We infer the contribution to each tracer from ocean re-emission by differencing our standard simulation with a model simulation with the net sea-air flux set to zero. For CO, we tag emissions from anthropogenic (fossil fuel plus biofuel) sources, biomass burning, and the photochemical oxidation of methane and BVOCs.

3. Results

3.1. Hg^0 and CO at Okinawa

[14] Figure 2 shows observed and modeled Hg^0 and CO at Okinawa during spring 2004. The frequent simultaneous increases in CO and Hg^0 concentrations reflect the influence

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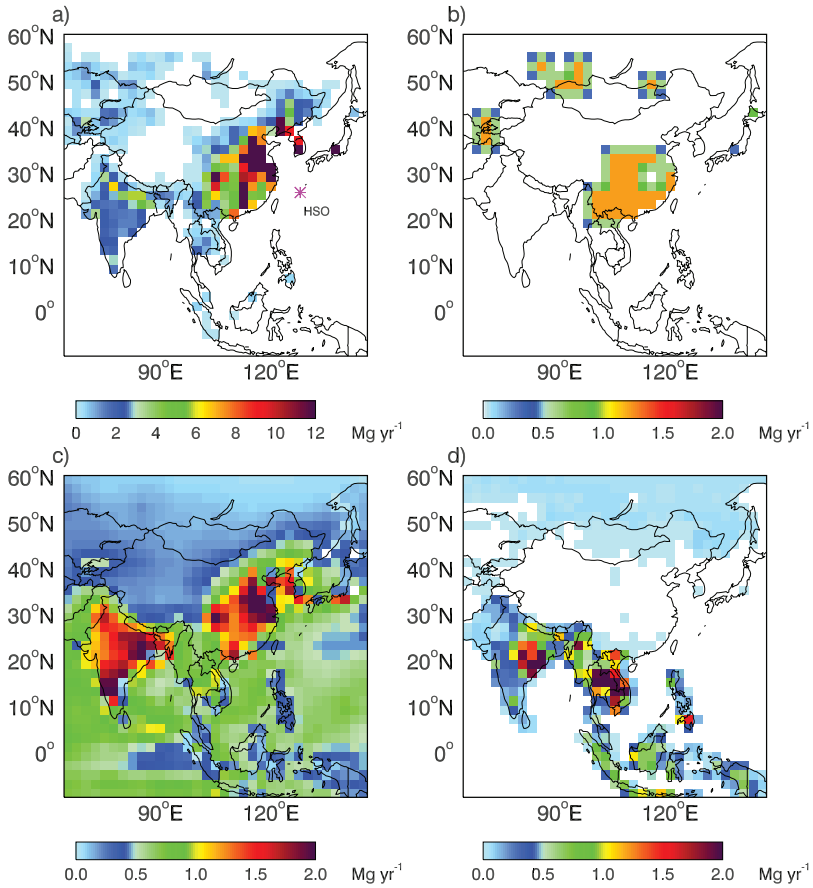

Figure 1. Distribution of annual Asian mercury emissions (Mg a^{-1}) from (a) anthropogenic, (b) geogenic, (c) land re-emission + ocean emission, and (d) biomass burning used in the GEOS-Chem model. The location of Okinawa is indicated by a star in Figure 1a.

of episodic outflow of polluted air from Asia reaching Okinawa [*Jaffe et al.*, 2005]. For CO, the mean observed value ± one standard deviation is 215 ± 65 ppbv compared to the modeled 209 ± 58 ppbv, while for Hg^0 the observed mean and standard deviation is 2.04 ± 0.38 ng m^{-3} standard air compared to the modeled 2.04 ± 0.25 ng m^{-3}. The model captures some of the observed temporal variability, with r^2 = 0.28 for CO and r^2 = 0.39 for Hg^0. The tagged simulations show that the variability in CO and Hg^0 is dominated by the variability in Asian tracers, as expected. For CO, the Asian anthropogenic tracer explains 97% of the variance in modeled total CO. Using multiple regression, we find that the Asian anthropogenic and land tracers together explain 97% of the variance in total Hg^0. Land emissions from Asia covary with the Asian anthropogenic tracer (r^2 = 0.87) due to the approximate colocation of the anthropogenic and land sources (Figure 1), which allows the tracers to be transported together.

[15] We used our tagged tracer simulation to divide the total CO and mercury concentrations over Okinawa into different source contributions for the 1 March to 31 May period (Table 1). Asian sources account for 44% of Hg^0 at Okinawa, with Asian anthropogenic, land, and biomass burning emissions contributing 26, 15, and 3%, respectively. The Asian anthropogenic contribution to Hg^{II} (45%) and particulate mercury (78%) over Okinawa is greater than the contribution to Hg^0 (Table 1) because the model shows Okinawa receiving direct transport of Asian Hg^{II} and particulate mercury emissions, but the short lifetimes of these species prevent them from reaching Okinawa by direct transport from other regions. For CO, the Asian anthropogenic contribution is 41%. During periods of enhanced outflow, the Asian anthropogenic contribution reaches up to 73% for CO and 43% for Hg^0 (Figure 2).

3.2. Hg^0 and CO at Mount Bachelor

[16] Figure 3 shows the time series of observed and modeled CO and TAM at MBO for 2004. At MBO, the mean model concentrations are 116 ± 20 ppbv and 1.61 ± 0.09 ng m^{-3} for CO and mercury, respectively, compared to observed means of 133 ± 28 ppbv and 1.53 ± 0.19 ng m^{-3}, yielding a mean model bias of −12% for CO and 5% for mercury. The CO bias is evident primarily in springtime. The r^2 value is 0.37 for CO and 0.34 for mercury. The model fails to reproduce the magnitude of the observed mercury peaks and has a standard deviation of only 0.09 ng m^{-3}. It also somewhat underestimates the standard deviation of CO. In contrast, the model better reproduces CO observations, including springtime long-range transport events, at the surface coastal site Cheeka Peak in Washington State [*Liang et al.*, 2004]. The difficulty at MBO is likely due to subgrid scale processes

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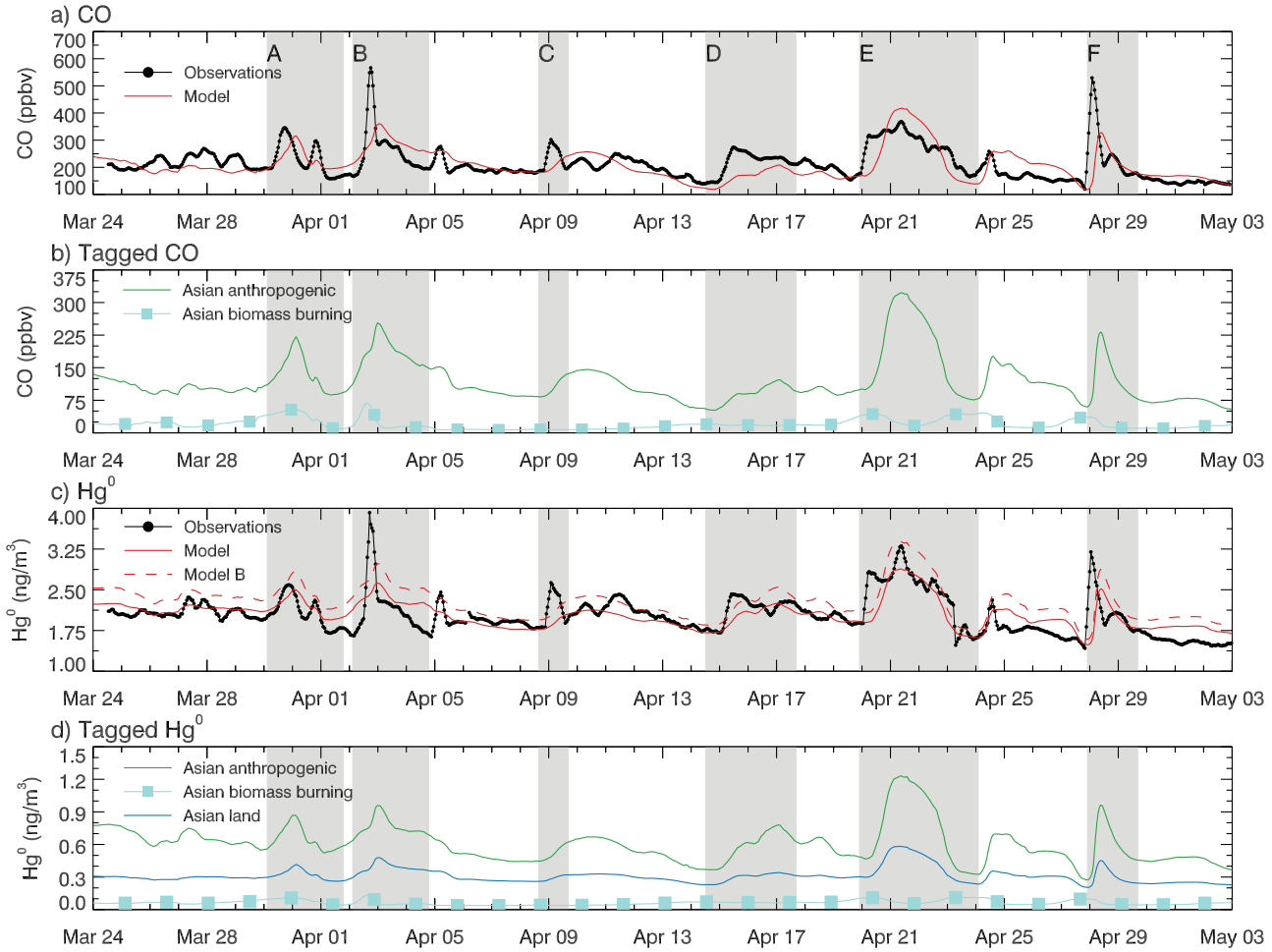

Figure 2. Time series of CO and Hg^0 at Okinawa for March–May 2004. (a) Observed (black) and modeled (red) CO. (b) Model CO tracers tagged by source. (c) Observed (black) and modeled (red) Hg^0. The dashed red line shows model simulation B (Asian Hg^0 emissions increased by 50%). (d) Hg^0 tracers tagged by source. The observations are averaged using a 6-h running mean. Asian transport events from *Jaffe et al.* [2005] are shaded in gray.

associated with the local mountainous terrain. The model grid box containing MBO has a surface altitude of 1.4 km above sea level. The model is sampled at the vertical level corresponding to the actual altitude of MBO (2.8 km above sea level), where the model captures the observed temperature. In the model, this level is usually above the boundary layer during spring. Springtime observations show that MBO experiences a mixture of boundary layer and free-tropospheric air, with a diurnal cycle in up-slope and downslope flow [*Weiss-Penzias et al.*, 2006]. Thus some of the model error is likely due to its inability to capture the transitions between boundary layer and free tropospheric air at the peak of Mount Bachelor.

[17] Unlike Okinawa, where enhancements are primarily driven by Asian transport, at MBO the tagged tracer simulations attribute the majority of the variability in CO to fluctuations in North American CO and CO from hydrocarbon oxidation, and much of the variability in mercury to variations in transport of regional land sources. During springtime, the North American land tracer explains 46% of the variability in TAM at MBO while the Asian tracers (anthropogenic + land + biomass burning) explain 42%. In the annual average, the North American land tracer explains only 29% of the TAM variability while the Asian tracers explain 57%. The large fraction of variability in the annual average explained by the Asian tracers is due partly to their effect on the seasonal cycle; the Asian tracers explain only 37% of the variance when monthly variability is removed by subtracting the 31-day running mean.

[18] *Weiss-Penzias et al.* [2007] discuss a number of Asian long-range transport events observed at MBO. The model captures some of these observed events (Figure 3). For the 9 and 10 April 2004 events (a, b), the model captures the timing of the events but greatly underestimates their magnitude. During the large 25 April event (c), the model shows a small enhancement in the Asian tracers for CO and mercury. However, the model predicts a larger Asian event 3 days later on 28 April. Our simulation captures the timing and duration of the 20 December event (h), and attributes it to concurrent increases in both the Asian and North American tracers. For several of the other observed events, there is a small increase in the Asian tracer corresponding to the timing of the event, but the model usually underestimates the magnitude of the events. This

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Table 1. Average Springtime Contributions of Source Regions to Hg^0 (ng m^{-3}), Hg^{II} (pg m^{-3}), and CO (ppbv) at MBO, Okinawa, and the United States[a]

	Okinawa (26.8°N, 128.2°E, 60 m)			MBO (44.0°N, 121.7°W, 2.8 km)			USA (30°–46°N, 125°–65°W, Surf.)		
March 1–May 31	Hg^0	Hg^{II}	CO	Hg^0	Hg^{II}	CO	Hg^0	Hg^{II}	CO
Anthropogenic[b]									
Asia	0.48(26)	6.3(45)	73(41)	0.29(18)	15(18)	30(24)	0.26(16)	5.6(15)	25(16)
North America	0.03(2)	0.2(2)	11(6)	0.03(2)	2(2)	17(13)	0.07(4)	5.9(15)	53(31)
Europe	0.10(5)	0.5(4)	20(11)	0.10(6)	4.8(6)	19(15)	0.10(6)	1.9(5)	19(12)
Rest of world[c]	0.12(7)	0.7(5)	3(2)	0.12(7)	7.0(8)	4(3)	0.11(7)	2.7(7)	4(2)
Biomass Burning[b]									
Asia	0.06(3)	0.4(3)	19(12)	0.05(3)	2.5(3)	10(8)	0.04(3)	1.1(3)	8(5)
Rest of world[d]	0.09(5)	0.5(4)	5(3)	0.08(5)	5.1(6)	6(5)	0.08(5)	2(5)	8(5)
Land[b,e]									
Asia	0.27(15)	1.4(10)	-	0.21(13)	11.1(13)	-	0.20(12)	4.3(11)	-
North America	0.12(7)	0.7(5)	-	0.16(10)	6.7(8)	-	0.27(16)	3.4(9)	-
Rest of world[f]	0.34(18)	2.0(14)	-	0.34(21)	19(22)	-	0.33(20)	7.3(17)	-
Primary ocean[g]	0.22(12)	1.3(9)	-	0.21(13)	12.3(14)	-	0.21(13)	4.7(12)	-
CO: Oxidation of CH_4 and BVOC	-	-	42(26)	-	-	39(32)	-	-	44(28)
Total	1.8(100)	14(100)	173(100)	1.6(100)	86(100)	125(100)	1.7(100)	39(100)	171(100)

[a]Percent contributions are given in parentheses.
[b]Each tagged tracer includes ocean re-emission.
[c]Includes all anthropogenic emissions from regions other than Asia, North America, and Europe.
[d]Includes all biomass burning outside of Asia.
[e]Land tracer includes both geogenic emissions and re-emissions from land.
[f]Includes land emissions from all regions except Asia and North America.
[g]Oceanic mercury that originates below the mixed layer is considered primary ocean.

underestimate is likely due to model resolution and the inability to capture the high concentrations of a thin plume.

[19] The modeled lifetime of total gaseous mercury in the northern hemisphere spring, calculated as the TGM concentration divided by the loss to deposition, is approximately 9 months, so concentrations at both Okinawa and MBO are influenced by global sources. MBO, though more distant from Asia, nevertheless receives 34% of its Hg^0 from Asian sources during spring. On average, these Asian sources include 0.34 ng m^{-3} (20%) from the Asian background, 0.11 ng m^{-3} (7%) from ocean re-emission of Asian emissions, and 0.12 ng m^{-3} (7%) from direct transport from Asia. Non-Asian land and primary ocean emissions are also major contributors at MBO, accounting for 31% and 13%, respectively. The North American anthropogenic contribution is only 2%, reflecting MBO's location upwind from most North American sources. The Asian anthropogenic percent contribution to Hg^0 at MBO shows little variability between seasons, with an Asian anthropogenic contribution of 18% in spring and in the annual average. In the model, the largest Asian Hg^0 contribution occurred on 28 April, when the Asian sources accounted for 41% of Hg^0 (Figure 3 and event c). Since the model underestimates the magnitude of the events, this modeled Asian contribution is likely an underestimate. For CO, the percent contribution is 24% in spring compared to 20% in the annual average. The stronger seasonality in CO reflects its shorter lifetime (~2 months) compared to the 9-month lifetime of TGM.

[20] If we consider the entire continental United States, we find a springtime North American anthropogenic contribution to surface Hg^0 concentrations of 4%, a N. American land contribution of 16%, an Asian anthropogenic contribution of 16%, and an Asian land contribution of 12%. The remainder comes from anthropogenic and land emissions from other regions of the world, biomass burning, and ocean emissions (Table 1).

3.3. Hg^0/CO Ratios

[21] Mercury emissions inventories remain highly uncertain. For the global inventory, the uncertainty is estimated to be ±25% for fuel combustion sources, ±30% for industrial processes, and a factor of 2–5 for waste disposal [*Pacyna et al.*, 2006]. The uncertainty in anthropogenic emissions from China is ±44% [*Streets et al.*, 2005]. Uncertainties in natural mercury emissions, with estimates varying by a factor of 4 [*Gustin and Lindberg*, 2006], as well as re-emissions of previously deposited mercury further complicate these estimates. *Streets et al.* [2006] estimate the uncertainty in CO emissions from China to be ±68%. However, Asian CO emissions inventories have also been constrained by comparison to ground-based, aircraft, and satellite observations [e.g., *Heald et al.*, 2003, 2004; *Palmer et al.*, 2003].

[22] A common method for estimating emissions based on observed concentration data is to use the ratio of two observed compounds [*Hansen et al.*, 1989]. *Jaffe et al.* [2005] report an Hg^0/CO ratio at Okinawa of 0.0053 ng m^{-3} $ppbv^{-1}$ for the spring 2004 observations, as listed in Table 2. Ratios for individual Asian transport events range from 0.0036–0.0074 ng m^{-3} $ppbv^{-1}$, with a mean of 0.0056 ng m^{-3} $ppbv^{-1}$ during Asian transport episodes [*Jaffe et al.*, 2005]. This is similar to the TGM/CO ratio of 0.0074 ng m^{-3} $ppbv^{-1}$ found in a Shanghai plume during the ACE-Asia campaign by *Friedli et al.* [2004] and the TAM/CO ratio of 0.0046 ± 0.0013 ng m^{-3} $ppbv^{-1}$ (mean ± stddev) for Asian long-range transport events at MBO [*Weiss-Penzias et al.*, 2007]. In contrast, *Weiss-Penzias et al.* [2007] observed a TAM/CO enhancement ratio of

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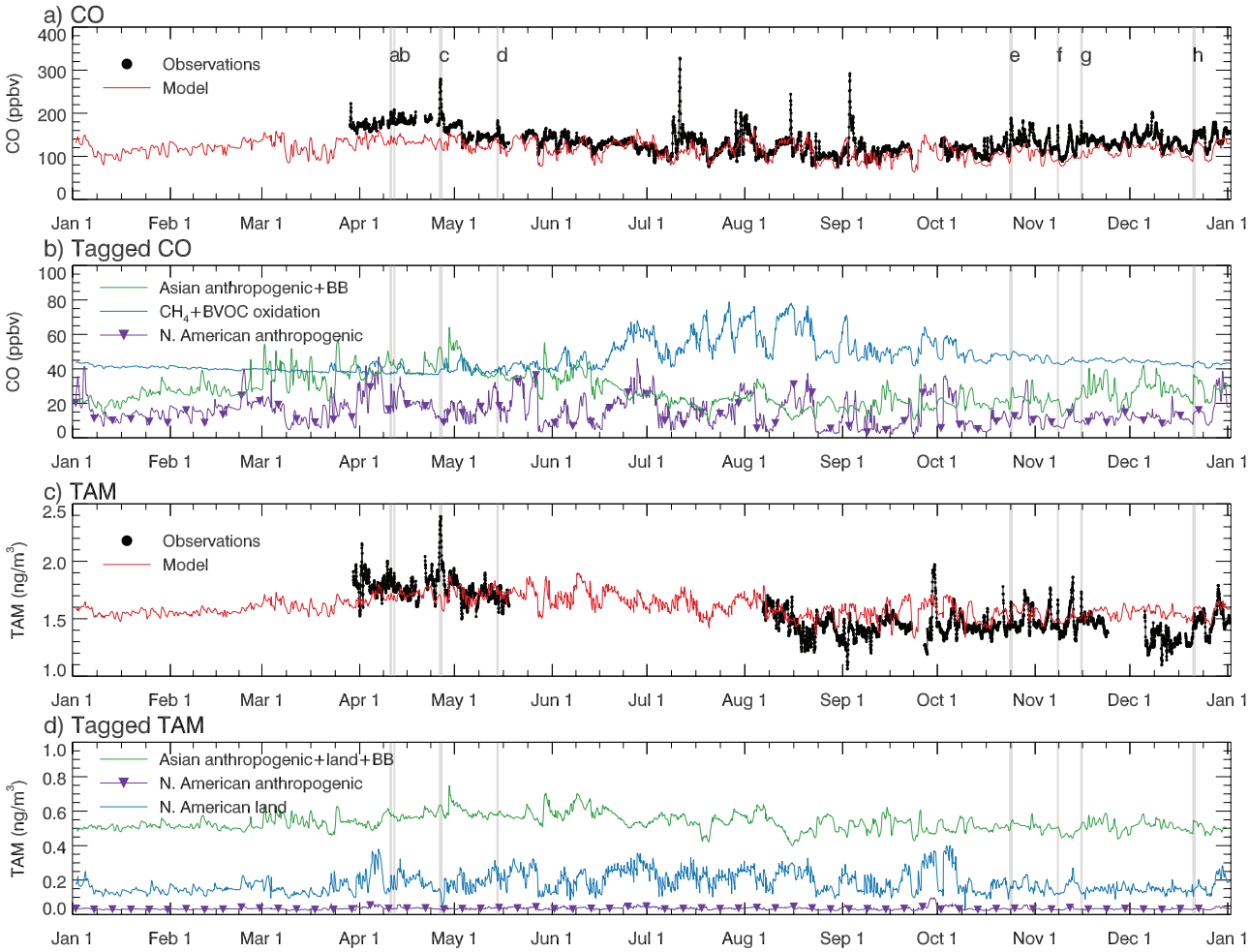

Figure 3. Time series of 6-h running mean observations and model at MBO for 2004. (a) Observed (black) and modeled (red) CO. (b) Model CO tracers tagged by source. (c) Observed (black) and modeled (red) total airborne mercury (TAM) from the standard simulation. (d) TAM tracers tagged by source. Asian long-range transport events from *Weiss-Penzias et al.* [2007] are shaded in gray and labeled Figures 3a–3h.

Table 2. Observed and Modeled Hg^0/CO Ratios (ng m^{-3} ppbv)

Location	Episode	Observations	Model	Model B[b]	Model C[c]	Model D[d]
Okinawa	spring 2004	0.0053	0.0039	0.0050	0.0062	0.0045
	A	0.0043	0.0044	0.0055	0.0066	0.0048
	B	0.0056	0.0029	0.0037	0.0045	0.0030
	C	0.0073	0.0045	0.0056	0.0068	0.0052
	D	0.0051	0.0065	0.0084	0.0103	0.0080
	E	0.0074	0.0044	0.0058	0.0072	0.0053
	F	0.0036	0.0050	0.0063	0.0076	0.0058
	HSO episode mean	0.0056	0.0046	0.0059	0.0072	0.0054
MBO	a	0.0032	0.0025	0.0024	0.0024	0.0026
	b	0.0035	0.0029	0.0029	0.0029	0.0032
	c	0.0042	0.0055	0.0057	0.0061	0.0063
	d	0.0048	0.0047	0.0044	0.0042	0.0045
	e	0.0026	0.0027	0.0033	0.0038	0.0030
	f	0.0044	0.0019	0.0032	0.0039	0.0030
	g	0.0051	0.0027	0.0033	0.0041	0.0029
	h	0.0051	0.0023	0.0034	0.0040	0.0031
	MBO 2004 Episode mean	0.0041	0.0031	0.0036	0.0039	0.0036
ACE-Asia[a]	04/30/01	0.0072	0.0061	0.0073	0.0087	0.0067

[a]The value is given for the Shanghai Plume in the ACE-Asia campaign [*Friedli et al.*, 2004].
[b]Model B has 280 Mg a^{-1} more Asian anthropogenic emissions and the same land emissions as the standard simulation.
[c]Model C has 610 Mg a^{-1} more Asian anthropogenic emissions and the same land emissions as the standard simulation.
[d]Model D repartitions the total emissions from the standard simulation with more anthropogenic emissions compensated by lower land emissions.

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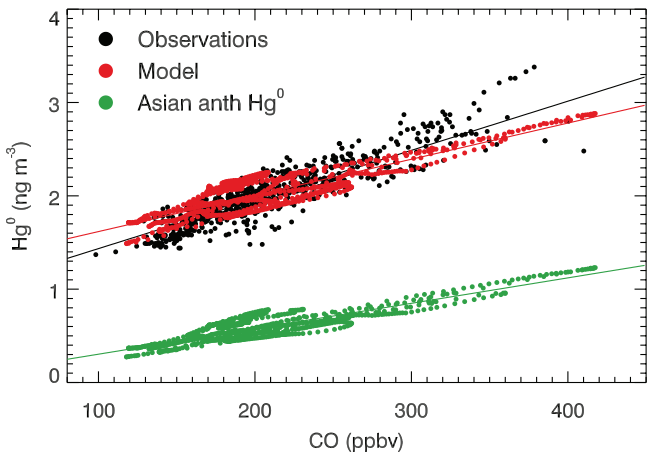

Figure 4. Scatterplot of Hg^0 (ng m^{-3}) versus CO (ppbv) concentrations for Okinawa 2004. Observations are in black, model in red, and model Asian tracer contribution in green. The mercury tracers are from the standard simulation.

0.0011 ng m^{-3} $ppbv^{-1}$ in U.S. industrial events and 0.0014 ng m^{-3} $ppbv^{-1}$ in biomass burning events.

[23] Using the observed ratio, *Jaffe et al.* [2005] calculated Asian Hg^0 emissions of 1460 Mg a^{-1} compared to 610 Mg a^{-1} Hg^0 in the anthropogenic inventory of *Pacyna et al.* [2006]. *Weiss-Penzias et al.* [2007] inferred Hg^0 emissions of 620 Mg a^{-1} from China, a factor of 2 larger than the recent anthropogenic inventory of 300 Mg a^{-1} from *Streets et al.* [2005] for China. The *Pacyna et al.* [2006] inventory for 2000 contains 360 Mg a^{-1} of Hg^0 emissions from China, 20% more than the *Streets et al.* [2005] inventory for 1999. *Pan et al.* [2006] compared a regional model with ACE-Asia data over the Yellow Sea and found that using Asian anthropogenic and biomass burning emissions of 1040 Mg a^{-1} total Hg with 830 Mg a^{-1} from Asian land, biogenic, and marine sources, their model underestimated mercury concentrations after subtracting background concentrations. They suggest that there may be an 80–200% underestimate in mercury emissions from China. Using 4D-Var to assimilate the ACE-Asia data, *Pan et al.* [2007] estimate Asian emissions of 1430–2270 Mg a^{-1} Hg^0, depending on their assumed boundary conditions.

[24] Here, we examine the ability of GEOS-Chem to reproduce observed Hg/CO ratios using the *Pacyna et al.* [2006] inventory. We sample the model hourly at Okinawa and find a slope of 0.0039 ng m^{-3} $ppbv^{-1}$, 26% lower than the observed slope of 0.0053 ng m^{-3} $ppbv^{-1}$ for the total data set (Table 2). Considering the ratios only during the Asian long-range transport events identified by *Jaffe et al.* [2005] yields a mean ratio of 0.0046 ng m^{-3} $ppbv^{-1}$, with a range of 0.0029–0.0065 ng m^{-3} $ppbv^{-1}$, 18% lower than the observed mean.

[25] In comparison to the previous studies described above, we find a smaller underestimate of Asian sources. The model's total Hg^0 tracer is able to capture the observed Hg^0/CO slope to within 30% because it includes a contribution from Asian land emissions and re-emissions. At Okinawa, these tracers covary in time with the Asian anthropogenic tracer and contribute to the magnitude of the observed events (Figure 2d). If we consider only the Asian anthropogenic tracer in the model, we get a slope of 0.0031 ng m^{-3} $ppbv^{-1}$, 42% lower than that observed (Figure 4). Anthropogenic emissions from other regions as well as Asian biomass burning also contribute to some of the events. However, since the model Hg^0/CO ratio is still lower than the observed ratio, we also examine the sensitivity of the model to higher Asian Hg^0 emissions.

[26] *Selin et al.* [2008] included a dry deposition sink for Hg^0 in the GEOS-Chem model and find that they need additional sources to balance this 1700 Mg a^{-1} loss. In particular, they increase the Asian anthropogenic Hg^0 source over the region 70°–152.5°E, 8°–45°N by 50% as well as increasing other anthropogenic sources and including artisanal mining. We conduct a simulation (Model B) by increasing the Asian anthropogenic source from 610 to 890 Mg a^{-1} Hg^0, but without including dry deposition of Hg^0 or increasing other sources. This simulation reproduces the observed Hg^0/CO slope for the total Okinawa data set (0.0050 ng m^{-3} $ppbv^{-1}$ modeled, 0.0053 ng m^{-3} $ppbv^{-1}$ observed) and the Asian transport events within 6%, but leads to a 13% positive bias in modeled Hg^0 for the total data set at Okinawa. Thus the Hg^0/CO ratio is consistent with a larger Asian anthropogenic source. However, lower background concentrations would be required to prevent model bias at Okinawa. Total Asian emissions of Hg^0 in this simulation are 1450 Mg a^{-1}. This estimate is smaller than the 2270 Mg a^{-1} of *Pan et al.* [2007] based on background concentrations of 1.2 ng m^{-3}, but agrees well with their estimate of 1430 Mg a^{-1} based on background concentrations of 1.5 ng m^{-3}. GEOS-Chem reproduces mean concentrations at nonurban land-based sites of 1.58 ng m^{-3} [*Selin et al.*, 2007]. Since the Hg^0/CO ratio at Okinawa is sensitive primarily to Hg^0 emissions, this improvement in the modeled ratio can be obtained either by increasing total emissions as described above, or by changing the speciation of the original emissions so that a larger fraction is emitted as Hg^0. *Edgerton et al.* [2006] found that 84% of the mercury in power plant plumes was Hg^0. Applying this speciation to the Asian emissions would lead to approximately a 50% increase in Asian Hg^0 (910 Mg a^{-1} Hg^0, 1470 Mg a^{-1} total Hg), leading to similar Asian Hg^0 emissions and a similar fit to observations compared with Model B.

[27] We conduct a third simulation (Model C) with Asian anthropogenic Hg^0 emissions over Asia doubled (1220 Mg a^{-1}) while other emissions are the same as in the base simulation. This yields a Hg^0/CO ratio of 0.0072 ng/m^3/ppbv for the Asian long-range transport events at Okinawa, a standard deviation above the observed mean (0.0056 ± 0.0016 ng m^{-3} $ppbv^{-1}$). For the total data set, we find a Hg^0/CO ratio of 0.0062 ng m^{-3} $ppbv^{-1}$ compared to the observed 0.0053 ng m^{-3} $ppbv^{-1}$. This simulation also leads to a 26% positive bias in Hg^0 concentrations at Okinawa, although this could potentially be reduced by inclusion of Hg^0 dry deposition. We therefore consider the doubling of Asian anthropogenic emissions an upper limit of the uncertainty.

[28] It is possible that an overestimate in the modeled land emissions could compensate for an underestimate in anthropogenic emissions. We examine this possibility with a model simulation (Model D) in which we decrease Asian

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Table 3. Comparison of Asian and Chinese Hg^0 Emissions (Mg a^{-1}) From Several Studies[a]

Reference	Emissions: Asia	Emissions: China
Jaffe et al. [2005]	1460	
Pacyna et al. [2006]	(610)	(360)
Pan et al. [2007]	1430–2270	720–1140
Weiss-Penzias et al. [2007]		(620 ± 180)
Streets et al. [2005]		(300)
This study	1260–1450 (890–990)	680–800 (530–580)

[a]Values are given for emissions from all sources, while emissions from anthropogenic sources only are in parentheses.

Hg^0 land emissions and re-emissions by 70% (from 540 to 160 Mg a^{-1}) and increase Asian anthropogenic Hg^0 emissions by 62% (from 610 to 990 Mg a^{-1}) so that the total emissions are the same as the reference simulation. We do not alter the spatial distribution of the land or anthropogenic emissions. This simulation improves the agreement of the modeled and observed Hg^0/CO ratios for the total data set and agrees with the observed ratios during long-range transport events to within 2% (Table 2). It also increases the overall model Hg^0 bias at Okinawa from 2% to 7%.

[29] Mercury emitted from Asia as Hg^{II} and then reduced in the atmosphere can also contribute to the amount of Hg^0 reaching Okinawa during transport events. In-cloud reduction of Hg^{II} to Hg^0 in GEOS-Chem is scaled according to constraints on seasonal variability and TGM liftetime [*Selin et al.*, 2007]. Furthermore, *Edgerton et al.* [2006] suggest that in-plume reduction of RGM could explain their observations of RGM and Hg^0. To quantify the role of Hg^{II} emissions in our standard simulation, we conduct a model simulation without anthropogenic emissions of Hg^{II}. We find that removing direct Hg^{II} emissions decreases the model Hg^0/CO slope during Asian long-range transport events from 0.0046 ng m^{-3} $ppbv^{-1}$ to 0.0039 ng m^{-3} $ppbv^{-1}$ for Okinawa. This suggests that aqueous reduction of Hg^{II} emissions during transport contributes ~15% to the observed Hg^0/CO ratio at Okinawa.

[30] During the ACE-Asia campaign, *Friedli et al.* [2004] report a TGM/CO ratio of 6.4×10^{-6} w/w in a plume originating in Shanghai that they sampled on 30 April 2001. This is equivalent to 0.0072 ng m^{-3} $ppbv^{-1}$. We sample the model along the 30 April 2001 flight track and find a TGM/CO ratio of 0.0061 ng m^{-3} $ppbv^{-1}$, which would be 23% lower in the absence of Hg^{II} emissions. Increasing Asian emissions by 280 Mg a^{-1} (Simulation B) results in a TGM/CO ratio of 0.0073 ng m^{-3} $ppbv^{-1}$, in better agreement with the observed ratio (Table 2). *Friedli et al.* [2004] observed a peak in TGM concentrations between 6 and 7 km altitude, which they attribute to lofted pollution. Examining the vertical profile of Asian Hg^0 above Okinawa in the GEOS-Chem model, we also see episodic enhancements at this altitude.

[31] We also compare modeled and observed TAM/CO ratios at MBO during 8 Asian long-range transport events in 2004, as defined by *Weiss-Penzias et al.* [2007]. This leads to a modeled TAM/CO ratio of 0.0031 ng m^{-3} $ppbv^{-1}$ for the standard simulation, compared to the 2004 observed mean ratio of 0.0041 ng m^{-3} $ppbv^{-1}$ [*Weiss-Penzias et al.*, 2007]. Simulation B (50% increase in Asian anthropogenic Hg^0) yields an enhancement ratio of 0.0036 ng m^{-3} $ppbv^{-1}$ and an 11% positive model bias in Hg^0. Simulation C (doubled Asian anthropogenic Hg^0) results in a small underestimate of the enhancement ratio (0.0039 ng m^{-3} $ppbv^{-1}$) and a 20% positive model bias. Simulation D (62% higher Asian anthropogenic and 70% lower land emissions) similarly increases the modeled enhancement ratio to 0.0036 ng m^{-3} $ppbv^{-1}$ (Table 1) without changing the mean Hg^0 at MBO.

[32] We consider simulations B and D the best fit to the observations. This leads to an estimated range of Asian Hg^0 emission of 1260–1450 Mg a^{-1}, of which 890–990 is anthropogenic (Table 3). This represents approximately a 50% increase over the anthropogenic emissions estimate of *Pacyna et al.* [2006]. For China, we find Hg^0 emissions of 680–800 Mg a^{-1} of which 530–580 Mg a^{-1} is anthropogenic. This lies within the uncertainty given by *Weiss-Penzias et al.* [2007] and at the low end of the *Pan et al.* [2007] estimate, but our anthropogenic emissions are larger than the *Streets et al.* [2005] inventory (Table 3).

[33] We use GEOS-Chem at 4° × 5° resolution to explore the effect of source regions on Hg^0/CO ratios globally. Figure 5 shows the Hg^0/CO regression slope for a 3-hourly time series in each model grid box at 930 hPa for April 2004. Slopes are only included where the Hg^0 versus CO regression yields $r^2 > 0.4$, and the standard deviation of CO exceeds 15% of mean CO. These criteria are met over and downwind of major source regions such as eastern China, Europe, and the eastern United States. In the southern hemisphere, South Africa and Australia are highlighted. We find large average Hg^0/CO ratios downwind of Asia (0.0040 ng m^{-3} $ppbv^{-1}$), and smaller ratios downwind of the eastern United States (0.0021 ng m^{-3} $ppbv^{-1}$) and Europe (0.0024 ng m^{-3} $ppbv^{-1}$). The highest Hg^0/CO ratio occurs near South Africa (0.0099 ng m^{-3} $ppbv^{-1}$), while outflow from Australia has a lower ratio of 0.0025 ng m^{-3} $ppbv^{-1}$. This supports the use of Hg^0/CO ratios as tracers of source regions. Care should be taken, however, in the interpretation of Hg/CO ratios as they reflect land as well as anthropogenic emissions of mercury. Furthermore,

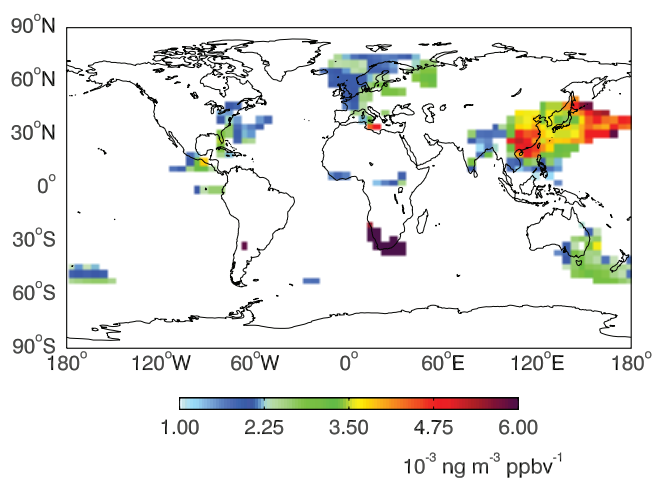

Figure 5. Hg^0/CO regression slopes for 3-hourly model output at 930 hPa for April 2004. Slopes are only given for grid boxes with a standard deviation of CO greater than 15% of mean CO and $r^2 > 0.4$ for the Hg^0/CO correlation.

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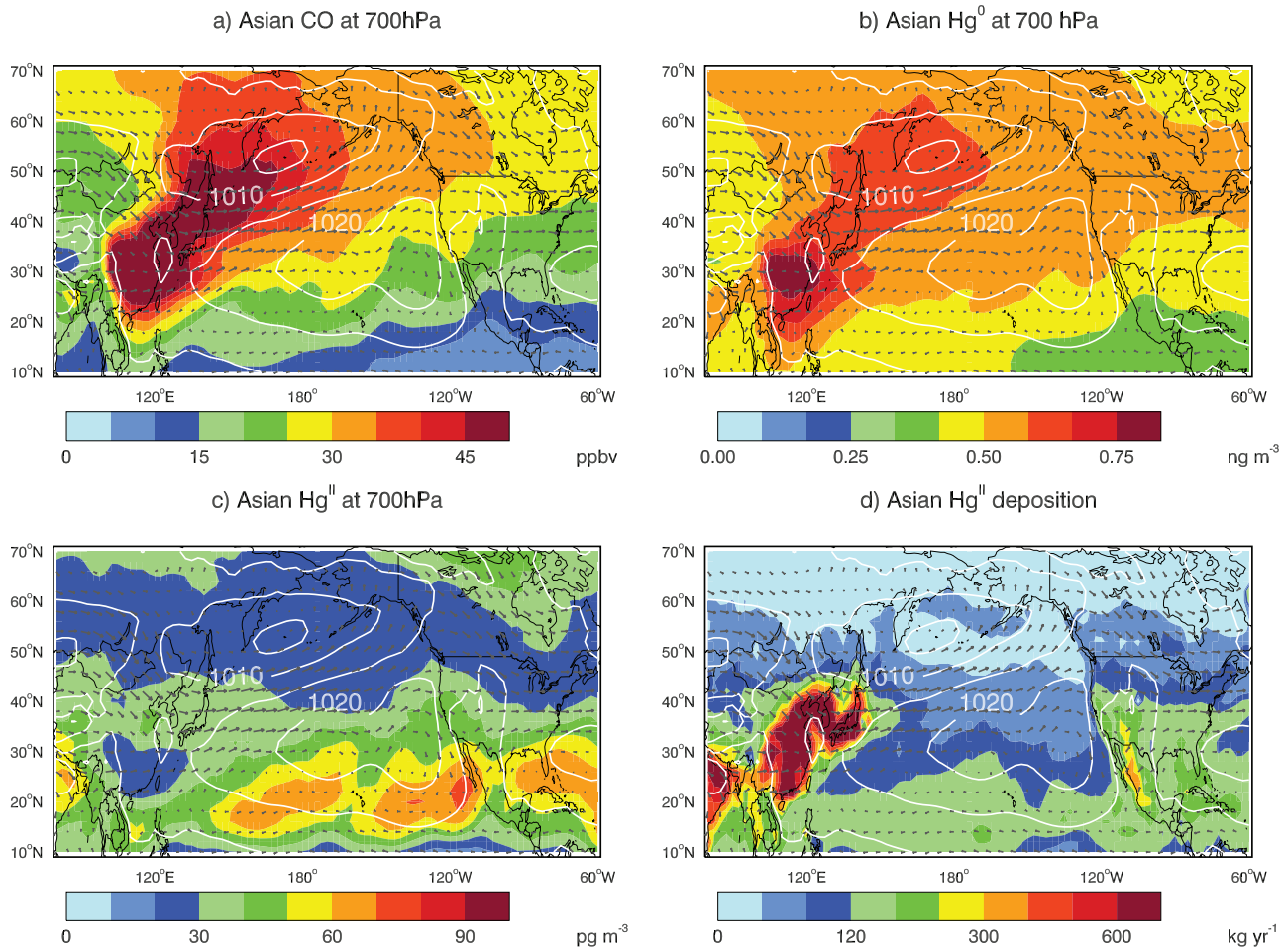

Figure 6. Map of March–May 2004 700 hPa concentrations of Asian (a) CO (ppbv), (b) Hg^0 (ng m^{-3}), and (c) Hg^{II} (pg m^{-3}) over the Pacific. Asian total deposition (kg a^{-1}) is shown in Figure 6d. Sea level pressure contours are overplotted in white, and gray arrows indicate wind at 700 hPa.

enhancement ratios may not be unique to a particular region. *Slemr et al.* [2006a] found TGM/CO ratios averaging 0.0050 ng m^{-3} $ppbv^{-1}$ at Mace Head, Ireland, similar to the ratios found in Asian outflow.

3.4. Trans-Pacific Transport of CO and Mercury

[34] The different mechanisms by which Asian Hg^0 and Hg^{II} reach North America affect the latitudinal distribution of their contributions (Figure 6). Hg^0, like CO, is transported to the northeast from Asia with the prevailing winds. Consequently, at 700 hPa the Asian influence is largest over Alaska, western Canada and the Northwestern United States (Figures 6a and 6b). In contrast, Asian emissions influence North American Hg^{II} concentrations through in situ oxidation of the global Asian Hg^0 pool rather than by direct advection of Hg^{II} from the emission source. The Asian Hg^{II} contribution is thus largest at low latitudes where high oxidant concentrations and descending dry air favor accumulation of Hg^{II} (Figure 6c). Total Hg^{II} concentrations are also high in this region for the same reason. Asian Hg^{II} deposition follows a similar pattern to Asian Hg^{II} concentration since both wet and dry deposition depend on Hg^{II} concentrations. Hg^{II} deposition is also larger over land, where dry deposition velocity is high (Figure 6d). In terms of percent contribution from Asian sources, the geographic distribution and the deposition of Hg^{II} are similar to that of Hg^0 and CO (Figure 7). This similarity occurs because Hg^{II} originates from oxidation of the Hg^0 pool and thus reflects regional percent contributions to that pool.

[35] Figure 8 shows a longitudinal cross-section of the contribution of CO, Hg^0, and Hg^{II} from Asian sources across the Pacific during spring. The contribution from Asian Hg^0 and CO decreases with distance from Asia, with Asian Hg^0 decreasing by 32% and CO decreasing by 56% at the surface between 140°E and 125°W. Both species show lower concentrations in the upper troposphere (Figures 8a and 8b). In contrast, Asian Hg^{II} increases at high altitudes, where it is not readily removed by wet or dry deposition or in-cloud reduction [*Selin et al.*, 2007]. Consequently, Asian Hg^{II} in the upper troposphere is due to oxidation of Asian Hg^0 emissions rather than to direct transport of Asian Hg^{II} emissions, which are mostly deposited close to their source (Figure 8c). The inverse altitude profiles of Hg^{II} and Hg^0 are consistent with observations at MBO [*Swartzendruber et al.*, 2006] and aircraft observations off the Florida coast [*Landis et al.*, 2005].

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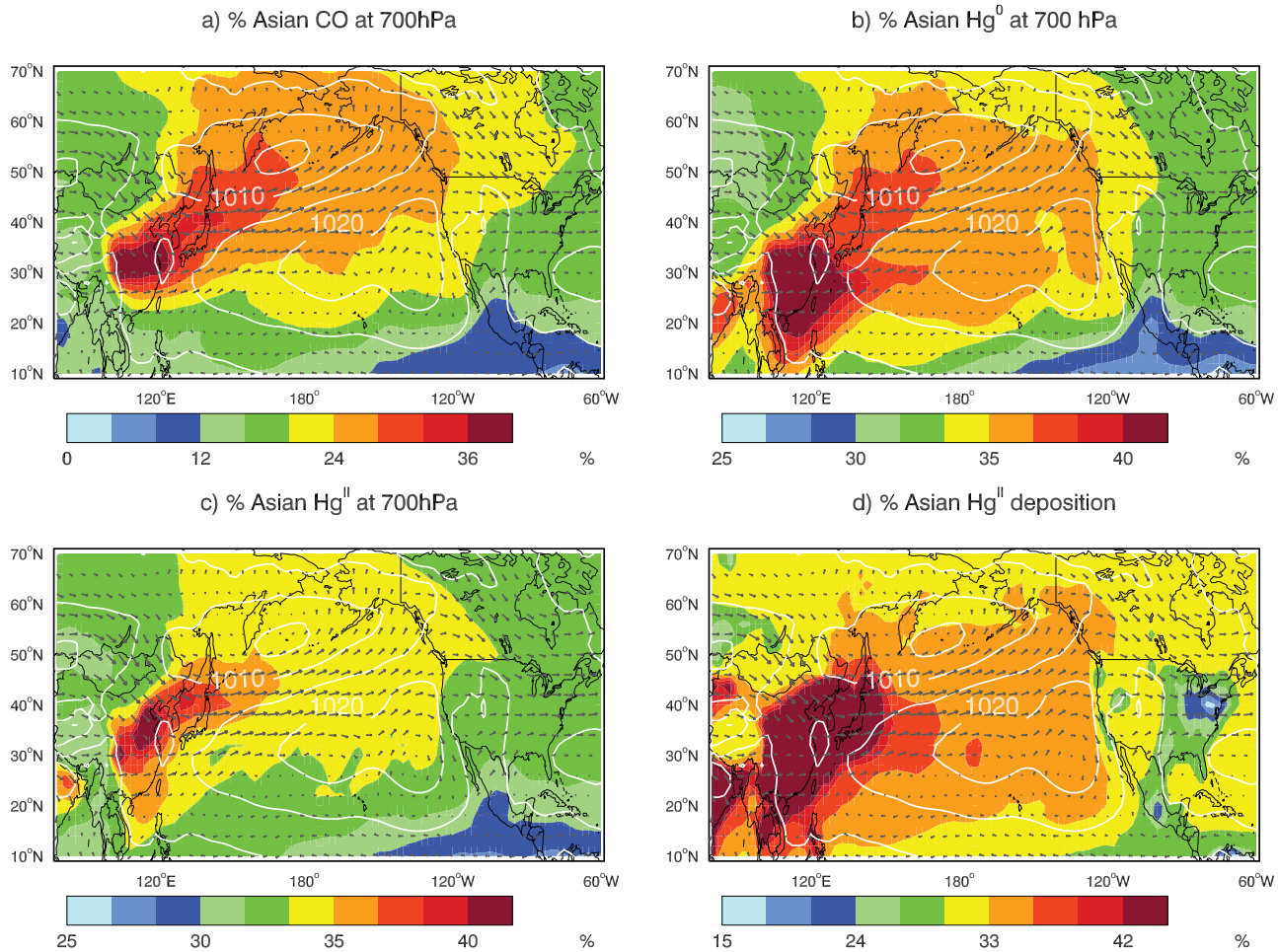

Figure 7. Map of March–May 2004 700 hPa percent contributions from the Asian tracers to (a) CO, (b) Hg^0, (c) Hg^{II}, and (d) total (wet + dry) deposition over the Pacific. Sea level pressure contours are overplotted in white, and gray arrows indicate wind direction.

[36] We consider the role Asian Hg^0 re-emitted from the ocean using a tagged simulation with ocean emissions turned off. We find that ocean re-emission increases the Asian contribution of Hg^0 over the west coast of North America by 29% (from 0.42 to 0.54 ng/m^3) (Figures 8b and 8d). Including Hg^0 ocean re-emissions increases the amount of Hg^0 available for oxidation and thus increases the background levels of Hg^{II} in the upper troposphere (Figures 8c and 8e).

3.5. Origin of Mercury Over the United States

[37] Table 4 shows regional contributions to Hg^{II} deposition (wet and dry) to Okinawa, MBO, and the United States. These contributions are based on the tagged tracer contributions in our standard simulation. Adding anthropogenic (including ocean re-emission) and land tracers together, we find a North American contribution to deposition over the continental United States of 26%, slightly lower than the 30% contribution of North American anthropogenic (direct + re-emission) to the US of *Seigneur et al.* [2004] and the 33% natural + anthropogenic North American contribution to deposition over North America of *Travnikov* [2005]. Our Asian land + anthropogenic deposition to the US is 25%, compared to 21% over the US [*Seigneur et al.*, 2004] and 24% over North America [*Travnikov*, 2005]. The Asian contribution in this study includes anthropogenic, geogenic, and land re-emission from Asia, as well as ocean re-emission of all those tracers. For comparison, *Seigneur et al.* [2004] include anthropogenic emissions from Asia and re-emission of those emissions from all regions, while *Travnikov* [2005] consider natural and anthropogenic emissions from Asia.

[38] The relative importance of Asian and North American sources to deposition over the U.S. varies geographically. We find that the average contribution to deposition in the western U.S. (125°–100°W) from the North American anthropogenic tracer is 11%, where as in the eastern U.S. (95°–75°W) the average contribution is 25% due to larger anthropogenic emissions in the eastern half of the country. This is similar to the results of *Selin et al.* [2007]. The Asian anthropogenic contribution to deposition is 15% over the western U.S. and 12% over the eastern U.S. For Hg^0 concentrations over the United States, the east-west gradient is smaller than for deposition, with approximately 15% coming from Asian anthropogenic sources in both the east and west of the country and the North American anthropogenic contribution increasing from 3% in the west to 6% in

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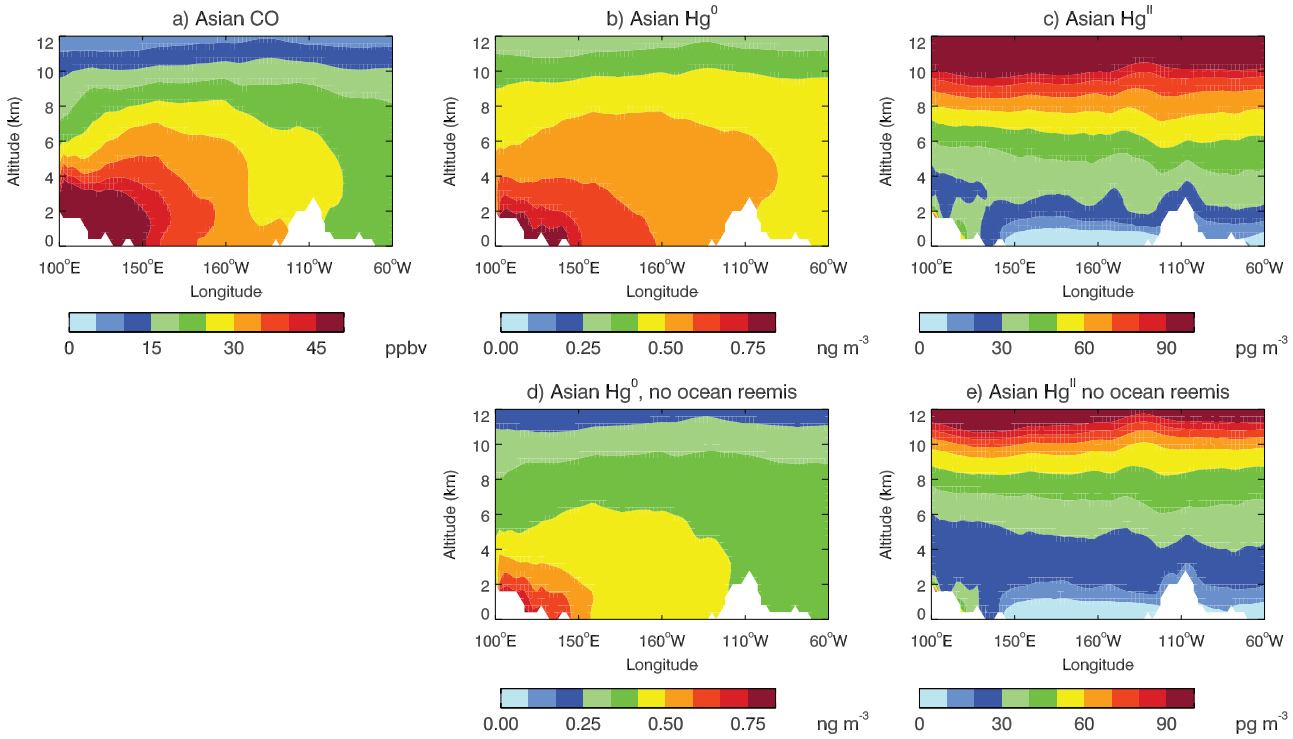

Figure 8. Longitude-altitude plot of Asian tracer concentrations averaged over 28°–60°N from 1 March to 31 May 2004 for (a) CO, (b) Hg^0 , and (c) Hg^{II}. Figures 8d and 8e show the Asian tracer concentrations excluding ocean re-emissions.

the east. The near-source deposition of Hg^{II} emissions drives the large east west gradient in deposition.

4. Conclusions

[39] We conducted a simulation of trans-Pacific transport of mercury including anthropogenic emissions tagged by region of origin as well as natural emissions and re-emissions from land and ocean. The simulation captures 39% of the observed variability in Hg^0 concentrations at Okinawa, Japan, and attributes the variability primarily to variability in the outflow of Asian anthropogenic and land emissions. At Mount Bachelor, Oregon, the model captures mean concentrations (1.53 ± 0.19 ng/m^3 observed, 1.61 ± 0.09 ng/m^3 modeled) of Hg^0, but underestimates the magnitude of the observed long-range transport events.

[40] We tested the model's ability to reproduce observed Hg/CO enhancement ratio during Asian long-range transport using the *Pacyna et al.* [2006] inventory for anthropogenic emissions. By including transport of Asian land emissions, which covary in time with transport of Asian anthropogenic emissions, the model reproduces the observed Hg/CO enhancement ratios to within approximately 30%. However, the ratio is underestimated, suggesting that Asian emissions in the inventory may also be underestimated. Increasing Asian anthropogenic Hg^0 emissions by 50% improves the ratio, but leads to a positive bias in the mean concentration. Altering the speciation of the emissions to increase Hg^0 yields a similar result. Increasing Asian anthropogenic Hg^0 emissions by 62% while reducing Asian land emissions so that total Asian emission is unchanged also improves the Hg/CO ratio. Doubling Asian anthropogenic emissions leads to a 29% overestimate of the Hg/CO ratio. We find that approximately 15% of the Hg/CO enhancement ratio at Okinawa is due to reduction of Hg^{II} emissions during transport. We cannot conclusively separate the effect of anthropogenic versus land emissions, but total Asian Hg^0 emissions of 1260–1470 Mg/a from anthropogenic, land, and biomass burning in the region 65°–146°W, 9°S–60°N are consistent with observations.

[41] Trans-Pacific transport of Hg^0 follows similar patterns to CO in both its latitudinal and vertical distribution. At MBO, we find a springtime Asian anthropogenic contribution to Hg^0 concentrations of 18% compared to a North American anthropogenic contribution of 2%. Including land emissions, these contributions increase to 31% and 12%, respectively. Ocean re-emission accounts for 22% of the Asian anthropogenic influence over the west coast of North America. Unlike Hg^0, Hg^{II} is not transported across the

Table 4. Annual Mean Percent Contribution to Wet and Dry Deposition of Hg^{II}

Annual Mean Deposition	%	Okinawa	MBO	USA
Anthropogenic	Asia	35	14	14
	N. America	1	19	16
	Europe	4	5	5
	rest of world	7	6	7
Biomass burning	Asia	2	2	2
	rest of world	5	5	5
Land	Asia	11	11	11
	N. America	6	9	10
	rest of world	17	17	18
Ocean	primary	12	12	12

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Pacific in the lower troposphere due to its short lifetime, but the long lifetime of Hg^{II} in the upper troposphere allows global transport.

[42] **Acknowledgments.** This work was supported by funding from the National Science Foundation grant ATM 0238530.

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RESPONSE TO BUNKER FUEL OIL: THE OPTIONS

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ABSTRACT: *As a general "rule of thumb," a dispersant response is not the most appropriate response to a spill of Intermediate Fuel Oil (IFO)-380 bunker fuel oil. However, as with all rules of thumb, there are some exceptions. There has been increasing evidence that a limited number of oil spill dispersants can be used on certain types of oil spill where previously dispersants would not have been considered. A new dispersant tested in field trials carried out by AEA Technology in 1997 (Lunel and Lewis, 1999), indicated that there* might *be an opportunity to treat viscous emulsions and bunker fuel oils by dispersant spraying. Following these field trials, AEA Technology undertook a number of laboratory-based studies, including tests in France during the first week of the* Erika *spill, which indicate that IFO-180 and IFO-380 bunker fuel oils may be dispersible under favorable conditions when fresh and when lightly emulsified.*

At present, the authors conclude that the rule of thumb—a dispersant response is not likely to be the most appropriate response to most spills of IFO-380—holds. However, the authors believe that there may *be some conditions when a dispersant response can be considered as part of a response to a spill of IFO-380 to reduce the volume of oil beaching. It has been recognized by most experts dealing with this issue that a field trial is needed to establish the validity of this assertion. In the absence of a field trial, the authors believe that a dispersant response to IFO-380 can be considered providing that:*

- *The reduction of volume beaching will result in a significant net environmental or economic benefit.*
- *The sea temperature is 10°–15°C or greater.*
- *The dispersant to be used is COREXIT®9500, Dasic Slickgone LTSW, Inipol 90, or Superdispersant 25.*
- *The characteristics of the IFO-380 are known and have been assessed by an oil spill expert at the time of the spill.*
- In situ *monitoring is in place to assess whether the response is effective.*

Introduction

Heavy fuel oil, classified as Intermediate Fuel Oil (IFO)-380, is the fuel oil used to power the majority of large merchant ships. This means that the probability of a spill of IFO-380 is far higher than that of crude oil. IFO-380 oils are also highly viscous, which means that they persist on the sea surface for longer than crude oils, increasing the chances of stranding on the shoreline. Finally, the high viscosity of these fuel oils has meant that it is generally considered that these oils could not be treated effectively with dispersants.

In the event of an IFO-380 spill, the current strategy worldwide is based on recovering a limited amount of oil at sea using heavy oil skimmers and then, since beaching is almost inevitable, removing stranded oil from the shoreline. In many cases, such as the recent *Erika* spill off the coast of France, where weather conditions are unfavorable, there are no alternatives. However, the *Erika* spill has also illustrated that removing IFO-380 from the shoreline can be associated with a high environmental impact and that the cost of shoreline cleanup per ton of oil recovered can be orders of magnitude more expensive than dispersing an oil slick at sea. The adverse publicity resulting from a shoreline response operation is also disproportionately high because of the ready access of the media and the public to the oiled site.

If dispersants are effective in reducing the level of shoreline oiling by IFO-380 (or under some circumstances possibly even preventing shoreline oiling), they could be a very cost-effective response method under the right sea conditions. This paper reviews the field and laboratory experiments carried out to date, including laboratory work completed during the first week of the *Erika* spill. The paper will weigh up whether there are some circumstances, such as warm sea temperatures and favorable sea states, where use of two to three dispersants formulated for use on heavy oils may be feasible to minimize the environmental and economic impact from a spill of IFO-380.

Dispersion of IFO-180 in field trials

The field trial in 1997 is described in detail in the *Proceedings* of the 1999 International Oil Spill Conference (Lunel and Lewis, 1999), a short summary is included here because of the direct relevance to the follow-on laboratory studies. The trial demonstrated that all but a small number of tarballs of a 20-ton (approximately 100-barrel) IFO-180 was dispersed as a result of a dispersant spraying operation. An IFO-180 fuel oil was weathered for 4 hours on the sea and had lost 3% to 4% of its original volume by evaporation. The fuel oil residue had incorporated approximately 30% volume water to form an emulsion with a viscosity of approximately 6,000 to 8,000 mPas (mPas = millipascals, the kinematic viscosity measured at 15°C and at a shear rate of 10 reciprocal seconds [s^{-1}]). Application of COREXIT®9500 at 1 part of dispersant to 44 parts of emulsion broke this emulsion to a very low water content and caused a reduction in viscosity to 4,000 mPas within minutes of the dispersant being applied. Subsurface monitoring clearly showed the significant increase in the rate of dispersion because of dispersant application. It was estimated that between approximately 50% and 75% of the emulsified IFO-180 fuel oil that was present on the sea surface appeared to have been dispersed by application of only 600 liters of dispersant. This indicated that IFO-180 weathered at sea for 4 hours is partially dispersible with a low treatment rate of dispersant, even under the relatively calm sea conditions at a 6–7 ms^{-1} wind.

Technical problems with the spray aircraft prevented more dispersant from being applied until it had been on the sea surface for 23 hours. By this stage, the IFO-180 fuel oil had lost 8% by volume and was starting to resemble a higher viscosity fuel oil, approaching an IFO-380 grade. It had incorporated up to a 20%

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volume of water to form emulsions with a wide range of viscosity varying from 7,400 mPas to 12,600 mPas (measured at 15°C and at a shear rate of $10s^{-1}$) and higher (up to 20,000 mPas or 40,000 mPas) in some patches. In addition, the wind speed dropped to below 5 ms^{-1}. Application of COREXIT®9500 to the IFO-180 residue that now resembled IFO-380 fuel oil caused some of the patches of lower viscosity emulsion to break and revert to oil residue with a viscosity of 7,000 mPas to 10,000 mPas and subsequently disperse. However, the observed levels of dispersed oil concentration were low and under the calm sea conditions, a significant proportion of emulsified fuel oil residue remained on the sea surface immediately following spraying. Remote sensing and visual observation from the surveillance aircraft failed to locate any remaining oil either 4–6 hours after the completion of the dispersant operation or the following day. However, small amounts were washed ashore 7 days after termination of the field trial.

The field trial did not indicate that a dispersant response should be mounted for all spills of IFO-180. Rather under favorable conditions of sea temperature, a rapid dispersant response has the potential to significantly reduce the volume of IFO-180 beaching (from around 100 barrels to less than 1 barrel in the case of the 1997 sea trial). In addition, the trial clearly showed that *in situ* field monitoring of dispersed oil concentrations should be an integral part of any future application of dispersants to bunker fuel oils. The field trial demonstrated that the dispersion of IFO-180 did not result in any visual evidence of a dispersed oil plume on which to base an assessment of effectiveness or failure of the response option.

Laboratory studies on IFO-380 dispersibility

Following the field trials with IFO-180 (Lunel and Lewis, 1999), laboratory-based dispersibility studies were undertaken using IFO-380, a heavier grade bunker fuel oil, to determine whether dispersant use could be considered for more viscous fuel oils. The objectives of these studies were to determine the effect of the following on the dispersibility of IFO-380:

- Oil composition
- Temperature
- Dispersant type and application ratio

The effect of IFO-380 heavy fuel oil composition on dispersant effectiveness. To determine the effect of oil composition on dispersant effectiveness, three heavy fuel oils (IFO-380 grade) were selected from the refineries at Milford Haven (United Kingdom), Slagen (Norway), and Sriracha (Thailand). These were produced from different crude oils by different processing routes and are representative of some of the types of IFO-380 that could be encountered at spills.

All three IFO-380s were emulsified to 30% water content and the viscosities of the oils and emulsions were measured at 5°C, 10°C, 15°C, and 22°C. Table 1 shows the viscosity (mPas) of the oils and emulsions at a shear rate of $10s^{-1}$. Table 1 indicates that the three IFO-380s tested have different viscosities both before and after emulsification at a given temperature. All three IFO-380s show that as the temperature increases, the viscosity of both the oils and their emulsion decreases.

Dispersibility tests were performed with the LR448 WSL protocol (Morris and Martinelli, 1983) on the emulsified IFO-380 emulsified to 30% water content to give an indication of the dispersibility. These tests were performed at 15°C using COREXIT®9500 (Table 2). The results demonstrate that the three different IFO-380 emulsions disperse to different extents at 15°C when treated with the same dispersant. All three oils met the specification for an IFO-380 but they were dispersible to differing degrees both before and after emulsification due to the variation in oil properties.

The effect of temperature on IFO-380 fuel oil composition on dispersant effectiveness. As shown in Table 1, the viscosities of the IFO-380 heavy fuel oils and emulsions vary considerably with temperature. Decreasing the temperature causes an increase in viscosity for a given heavy fuel oil and emulsion making it more difficult to disperse. The effects of temperature on the Milford Haven dispersibility both before and after emulsification are shown graphically in Figures 1 and 2, respectively.

Table 1. Comparison of Milford Haven, Slagen, and Thailand IFO-380 viscosity results.

		Viscosity of IFO-380 (mPas) at $10s^{-1}$			
Source of IFO-380	**Water content (%)**	**5°C**	**10°C**	**15°C**	**22°C**
Milford Haven	0	49,112	27,499	10,117	5,071
Slagen	0	53,427	25,868	10,136	4,011
Thailand	0	25,109	—	7,349	3,758
Milford Haven	30	144,470	95,420	34,072	14,693
Slagen	30	107,550	50,006	25,379	9,769
Thailand	30	66,281	—	21,484	9,934

Table 2. Milford Haven, Slagen, and Thailand emulsion dispersibilities at 15°C.

	Dispersant efficiency on IFO-380 Temperature 15°C		
	Milford Haven Viscosity 34,100 mPas	**Slagen Viscosity 25,400 mPas**	**Thailand Viscosity 21,500 mPas**
	30% Water	**30% Water**	**30% Water**
1:10	25%	—	—
1:25	23%	40%	24%
1:50	17%	34%	21%
1:100	21%	23%	10%

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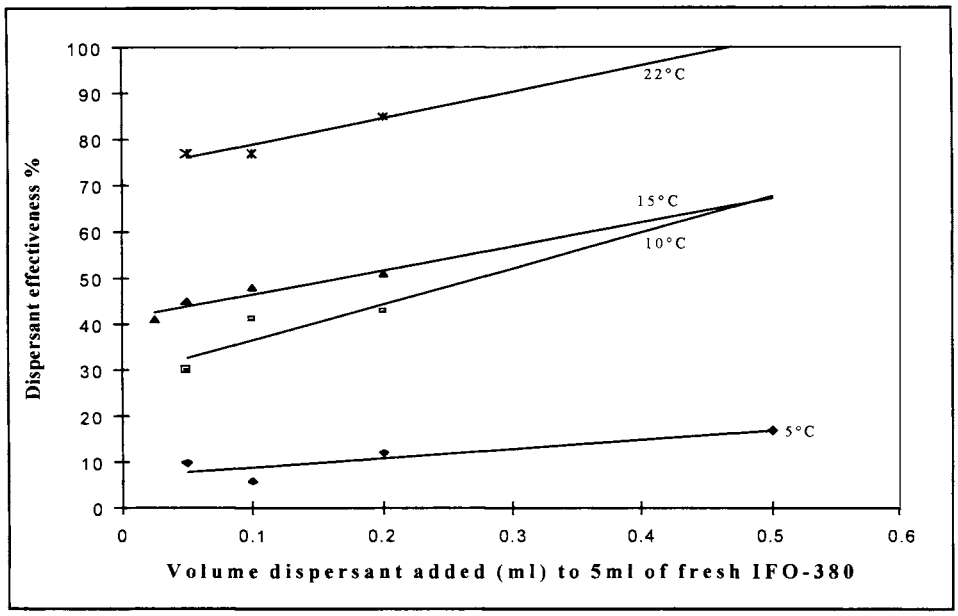

Figure 1. Dispersibility of fresh IFO-380 with COREXIT®9500 at four temperatures.

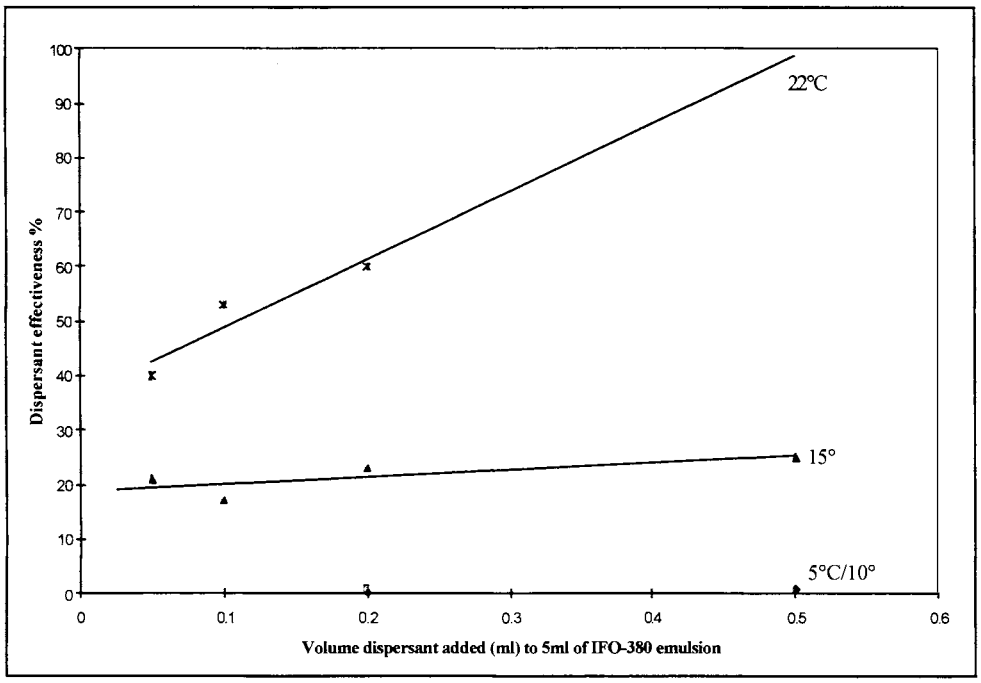

Figure 2. Dispersibility of emulsified IFO-380 (30% water content) at four temperatures.

The graphs illustrate that the dispersibility of the IFO-380 from the Milford Haven refinery was significantly effected by temperature. By comparison of laboratory WSL test method results with measurements of dispersion made at sea steady-state, continuous oil release experiments (Lunel and Davies, 1996), a cutoff level of 15% in the WSL test method has been proposed (Lunel and Lewis, 1999) as an indicator of the difference between an oil being dispersible and nondispersible at sea in wind speeds above 5 ms^{-1} (the onset of significant breaking wave activity). Using this threshold level of 15% based on field trials at sea, the dispersibility values were above the threshold at both 22°C and 15°C using COREXIT®9500. However, for the emulsified oil at 10°C, and the oil and emulsion at 5°C, the dispersibility values were below the proposed threshold.

Dispersant effectiveness of five dispersants on IFO-380 from Milford Haven Refinery. Five dispersants were tested on the Milford Haven IFO-380 oil and emulsion at 15°C to provide an indication of dispersant effectiveness. These results cannot be directly applied to other IFO-380s or to temperatures different from 15°C. Tables 3 and 4 show the results of the tests at 15°C on the fresh and 30% water content emulsion of Milford Haven IFO-380, respectively. The effectiveness values shaded in gray in the following tables indicate effectiveness values that are above the proposed 15% threshold.

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Table 3. Dispersant effectiveness on fresh Milford Haven IFO-380 at 15°C.

	Dispersant efficiency on fresh Milford Haven IFO-380 Viscosity 10,117 mPas at 10^{-1}, temperature 15°C				
Dispersant:oil ratio	**Agma DR379**	**COREXIT®9500**	**Dasic LTSW**	**Dasic NS**	**Superdispersant 25**
1:10	—	—		—	—
1:25	26%	51%	53%	22%	63%
1:50	12%	48%	42%	24%	52%
1:100	9%	45%	33%	31%	50%
1:200	—	41%	—	22%	—

Table 4. Dispersant effectiveness on emulsified Milford Haven IFO-380 at 15°C.

	Dispersant efficiency on 30% water content Milford Haven IFO-380 Viscosity 33,372 mPas at $10s^{-1}$, temperature 15°C				
Dispersant:emulsion ratio	**Agma DR379**	**COREXIT®9500**	**Dasic LTSW**	**Dasic NS**	**Superdispersant 25**
1:10	5%	25%	18%	11%	24%
1:25	1%	23%	10%	5%	16%
1:50	—	17%	—	2%	4%
1:100	—	21%	—	3%	—

The laboratory testing indicated that all the dispersants tested are effective on the fresh Milford Haven IFO-380 at a dosage of 1:25. COREXIT®9500, Dasic Slickgone LTSW, Dasic Slickgone NS, and Superdispersant 25 are all capable of dispersing the oil at lower dose rates. IFO-380 will rapidly emulsify when released on the sea surface under most sea conditions. Even with an immediate standby dispersant spray capability, it is likely to be at least 2 hours before a dispersant spray operation can commence. Therefore, it is the dispersibility results on the 30% water content IFO-380 emulsion that provide the most appropriate indication of the likely success of a dispersant spray operation.

Following emulsification, the viscosity of the Milford Haven IFO-380 increased from 10,117 mPas to 33,372 mPas, which substantially reduced the ability of the dispersants to break the emulsion and disperse the oil. A comparison of Tables 3 and 4 indicate that emulsification of the Milford Haven IFO-380 to 30% water content caused a significant reduction in dispersant effectiveness for all of the dispersants tested in this study. The laboratory testing highlighted the following:

- Superdispersant 25 and COREXIT®9500 produce dispersions that are above the proposed 15% threshold at ratios of 1:25 indicating that dispersant treatment of IFO-380 may be a feasible response option.
- Reducing the dispersant to emulsion ratio (DER) to 1:50 or 1:100 did not appear to have a significant effect on the effectiveness of COREXIT®9500 on this emulsion. This may have operational significance in some spills if this trend was also obtained in the field, for example, in the *Sea Empress*, the dispersant:oil ratio has been estimated at between 1:40 to 1:80 (Lunel *et al.*, 1997).
- Dasic LTSW produce dispersibility values which are above the 15% threshold at a ratios of 1:10.
- Dasic NS and Agma DR379 do not appear to be effective on an emulsion of IFO-380 from the Milford Haven refinery. Dasic NS may be effective on the fresh IFO-380 (Table 3). However, the time window for such an application will be extremely short.

Summary. The laboratory studies indicate that:

1. The three different IFO-380 emulsions disperse to different extents at 15°C when treated with the same dispersant. All three oils met the specification for an IFO-380, but they were dispersible to differing degrees both before and after emulsification due to variation in the oil properties.
2. The implication is through the effect on the viscosity of the IFO-380 oils and emulsions, the temperature has a significant effect on dispersant effectiveness. It is not possible to extrapolate from the results obtained in this study to lower sea temperatures, where the dispersibility of IFO-380 will be reduced significantly.
3. In summary, at the likely operational dosages it appears from these laboratory tests that Superdispersant 25 or COREXIT®9500 would be the most likely to be effective for treating an IFO-380 spill (Slickgone LTSW may also be effective but only at high dosages).

However, it is important to note that laboratory studies provide an indication of the effectiveness of dispersants under certain conditions and provide an approximate simulation of the dispersion processes that occur at sea. They are not able to replicate exactly all the conditions at sea. Therefore, when a dispersant is identified as being effective on certain oil types in laboratory conditions, it is advisable to consider whether it has been shown to be effective at sea. COREXIT®9500 has been shown to be effective in real incidents and in experimental field trials on IFO-180 fuel oil and on viscous crudes, such as Alaska North Slope and Captain. Therefore, the authors have considerable confidence that it would be reasonably effective in the event of a real incident. However, there is no evidence through real incidents or experimental field trials that Superdispersant 25 is effective on either heavy fuel oils or viscous crude oils at sea. In fact, to date there are no field data with Superdispersant 25. Therefore, while Superdispersant 25 proves to be effective in the laboratory, it has yet to be proven in the field.

Erika incident

The *Erika*, a Maltese-registered tanker, split in two in heavy seas on the December 12, 1999. The incident released around 10,000 tons of IFO-380 onto the sea surface (this heavy fuel oil is classed locally as French No. 2 Export Fuel). The oil was enroute from a Total-Fina refinery in Dunkirk to Livorno in Italy. A

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combination of the high winds, the turbulent seas, and the very high viscosity of the surface oil hampered the response operation.

Incident response. The initial response to the incident largely focused on tracking the trajectory of the slick. Two oil spill models were used to predict the trajectory of the slick. The Meteo France model is run at their laboratories in Toulouse. The Oil Spill Information System (OSIS) model was run locally at CEDRE and by the National Chemical Emergency Centre (NCEC). Using the long-term weather forecasts from Meteo France, these models predicted that the oil would remain at sea for at least the first 10 days. These predictions were confirmed by the remote sensing being carried out by the French Customs aircraft, although the detailed trajectory of the HFO was not well reflected in any of the models used in the incident. This is because the slick floated low in the water and was not driven by the wind to the same extent as the majority of oil spills. The wind direction had turned continually in the first 10 days of the spill keeping the surface slick out to sea. The predictions made on December 22 using OSIS are given in Figure 3. These predictions used Meteo France forecasts of wind conditions that did not fully reflect the severe southwesterly storms that occurred on and just before Christmas. This meant that the heaviest area of oiling was slightly to the north of that shown in Figure 3. The oil actually started to come ashore sometime between December 25 and December 27.

Taking into account the gale force 8 winds, it was decided by the French authorities that an immediate dispersant response was not possible on the first day. It was also felt that the surface oil had emulsified to such an extent that dispersant was unlikely to be effective and it was not possible to carry out *in situ* monitoring under those conditions. The first sample taken from the sea surface was at the end of December 15 by which time the oil had weathered on the sea surface for 4 days. The viscosity of the sample by this point was 260,000 mPas (at $3s^{-1}$) and had incorporated 30% water. When this heavily emulsified emulsion was tested in the laboratory, it was confirmed that it was not dispersible.

Dispersibility evaluation. Researchers at CEDRE also used the flume tank at CEDRE, the Polludrome, to generate emulsions of the IFO-380. Emulsification occurred rapidly in the wave tank. In 5 hours, the emulsion contained 30% water and its viscosity had risen from an initial viscosity of 43,000 mPas (at 12°C and $10s^{-1}$) to 70,000 mPas (at 12°C and $10s^{-1}$). By 23 hours, the emulsion had incorporated 50% water and had reached a viscosity of 260,000 mPas (at $1s^{-1}$), similar to the viscosity after 4 days weathering at sea. The sample of the viscous, 260,000 mPas emulsion from the Polludrome was not dispersible.

However, bearing in mind the large volume of IFO-380 still in the wreck of the tanker, the potential to disperse any freshly released oil was investigated. The dispersibility testing on the nonemulsified IFO-380 from the Dunkirk refinery showed surprisingly high values for dispersant efficiency. At 11°C, the surface sea temperature at the time of the incident, the fresh oil has a viscosity of 44,000 mPas. Dispersant efficiencies were measured at 20%, 34%, and 31%, respectively for the dispersants Superdispersant 25, COREXIT®9500, and Inipol 90 using the WSL test (Table 5). These values are significantly above the 15% threshold (Lunel and Davies, 1996) and suggest that the fresh *Erika* IFO-380 might be dispersible at a dispersant:oil ratio of 1:25. Effectiveness values of greater than 30% were measured using the WSL dispersant test even at temperatures as low as 7°C with one of the dispersants where the oil viscosity was 128,000 mPas at $10s^{-1}$ (Table 5).

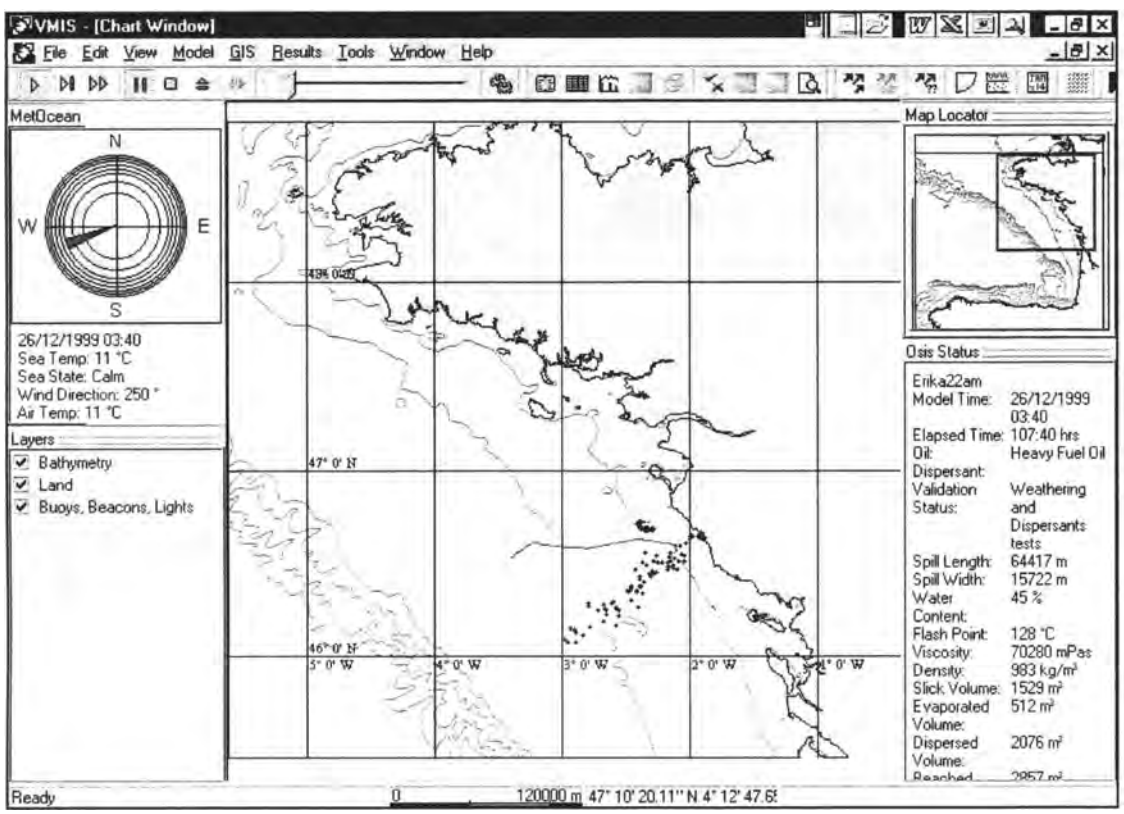

Figure 3. OSIS 3 prediction of likely time for oil beaching December 25–26, 1999 (based on 5-day weather on December 22, 1999).

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Table 5. Dispersant effectiveness on fresh *Erika* IFO-380 at 7–17°C.

Temperature (°C)	Viscosity (mPas)	COREXIT® 9500	Inipol 90	Superdispersant 25
17	≈20,000	49%		28%
11	44,000	34%	31%	20%
7	128,000	37%	8%	8%

Table 6. Dispersant effectiveness on emulsified *Erika* IFO-380 at 11°C.

Water content (%)	Viscosity (mPas)	COREXIT®9500	Inipol 90	Superdispersant 25
15	50,000	29%	44%	21%
20	94,000	18%	23%	10%

To determine the potential time window for dispersant use, low water-content emulsions were prepared and tested for dispersibility at 11°C. The 15% water content emulsion with a viscosity of 50,000 mPas at 11°C and $3s^{-1}$ was treated with Superdispersant, COREXIT®9500, and Inipol 90 using a dispersant:emulsion ratio of 1:10. Values of above the 15% threshold were achieved with these dispersants suggesting that the 15% water content emulsion remained dispersible (Table 6). Treatment of the 20% water content emulsion of viscosity 94,000 mPas at 11°C and 3 s^{-1} produced lower dispersant efficiency values using the WSL test (Table 6). However, these values indicate that even this very high viscosity emulsion may remain dispersible to some degree using COREXIT®9500 and Inipol 90.

One feature of note was that if the mixing time of the WSL test was extended by a further 5 minutes, to 10 minutes in total, then the dispersant efficiencies were increased. It is not known whether this extended mixing time is representative of the dispersion process at sea, more field trial validation is needed in this area. The effect of increasing mixing time was particularly pronounced with the dispersant Inipol 90. For example, at 11°C, the efficiency values were increased from 31% to 57% for the fresh oil and 23% to 76% for the emulsified oil.

The time taken to disperse the oil, combined with the dark color of the fuel oil that would mean that even if dispersion was successful at sea, it is extremely unlikely that a visible dispersed plume would be produced. *In situ* monitoring would be an essential part of the response.

Conclusions

As a general rule of thumb, a dispersant response is not the most appropriate response to a spill of IFO-380 bunker fuel oil. However, as with all rules of thumb, there are some exceptions. There has been increasing evidence that a limited number of oil spill dispersants can be used on certain types of bunker fuel oil spill where previously dispersants would not have been considered. A new dispersant tested in field trials carried out by AEA Technology in 1997 (Lunel and Lewis, 1999) indicated that there *may* be an opportunity to treat viscous emulsions and bunker fuel oils by dispersant spraying. Following these field trials, AEA Technology undertook a number of laboratory-based studies including tests in France during the first week of the *Erika* spill, which indicate that IFO-180 and IFO-380 bunker fuel oils can be dispersible when fresh and emulsified under favorable conditions. Sea temperature is particularly important and effectiveness drops off significantly in the temperature range of 10–15°C or below.

It is important to note that the dispersibility varies according to the properties of the oil and with dispersant type. Specific testing has been carried out on three different types of bunker fuel oil using a range of dispersants in these laboratory studies. The dispersibility testing on these oils tested suggested that Superdispersant 25 or COREXIT®9500 would be the most likely dispersants to be effective in treating an IFO-380 spill (Slickgone LTSW may also be effective, but only at high dosages).

In the *Erika* incident, which resulted in the release of around 10,000 tons of IFO-380, the gale force 8 winds prevented an active response at sea during the initial release of the oil. The high seas and viscous oil prevented an effective dispersant or mechanical recovery response, although a small proportion of the surface oil was recovered through mechanical recovery during one day when the winds dropped. This most recent spill supports the rule of thumb that a dispersant response is not the most appropriate response to most spills of IFO-380.

However, the laboratory testing undertaken at the time of the *Erika* spill suggests that it *may* be dispersible when fresh and lightly emulsified under the right conditions of sea temperature and sea state. The work suggests that had the *Erika* spill occurred during the summer months, a dispersant response should at least be considered at the initial stages of a spill before the IFO-380 forms a high viscosity emulsion.

The key variable is sea temperature because at low temperatures the IFO-380 oil may already be at a high viscosity and, therefore, may not disperse. The rate of emulsification is also important in any spill of IFO-380 fuel oil as it controls the rate of increase in viscosity. In particularly rough sea states (high wind speeds), the time window for using dispersants on IFO-380 is likely to be very limited as the oil may emulsify quickly to a state that is not dispersible. In moderate sea conditions, dispersants are more likely to be an option for treating IFO-380 as the oil will remain at a lower viscosity for longer periods of time because the rate of emulsification will be slower.

At present, the authors conclude that the rule of thumb—a dispersant response is not likely to be the most appropriate response to most spills of IFO-380—holds. However, they believe there *may* be some conditions when a dispersant response can be considered as part of a response to a spill of IFO-380 to reduce the volume of oil beaching. It has been recognized by most experts dealing with this issue that a field trial is needed to establish the validity of this assertion. In the absence of a field trial we believe that a dispersant response to IFO-380 can be considered providing:

- The reduction of volume beaching will result in a significant net environmental or economic benefit (Lunel and Baker, 1999).
- The sea temperature is 10°–15°C or greater.
- The dispersant to be used is COREXIT®9500, Dasic Slickgone LTSW, Inipol 90, or Superdispersant 25.
- The characteristics of the IFO-380 are known and have been assessed by an oil spill expert at the time of the spill.
- *In situ* monitoring is in place to assess whether the response is effective.

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Acknowledgements

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FROM MONTANA TO THE COAST, COAL DUST THREATENS HUMAN HEALTH

A new study shows Bellingham and Longview terminals would harm communities along rail route

April 4, 206

If the coal industry gets its way, the Columbia River Gorge will soon host dozens of loaded coal trains each day, carrying as much as 96 million tons annually to export terminals in Washington. It's an amount of coal so vast that a year's worth of the cargo would dwarf even the biggest landscape features in the region and overshadow the tallest structures in nearby Portland, Oregon. We've long known that *burning* coal is harmful to air quality, and now a recent study conducted in the Gorge shows that even just *transporting* it in the usual way—in uncovered, open-top rail cars—also has serious air quality consequences.

Columbia River Gorge study

The research, led by Daniel Jaffe, professor of atmospheric and environmental chemistry at the University of Washington, measured diesel particulate matter and coal dust released by the coal trains that currently traverse the railways in the Columbia River Gorge. Both particulate matter and coal dust contain toxic, microscopic pollutants harmful to our health.

Jaffe and his colleagues set up monitoring equipment next to a rail line between the towns of Lyle and Dallesport, Washington, and took measurements every 10 seconds of the respirable particulate matter emitted by both ordinary freight trains and coal trains. After measuring emissions from 367 trains over a 2-month period, the scientists found that diesel-powered open-top coal trains emitted twice as much particulate matter as diesel-powered freight trains. Notably, coal dust made up approximately half of the coal train emissions.

To date, few studies have evaluated air quality impacts for people living near rail lines where coal is transported. The Jaffe study, which was published in the journal *Atmospheric Pollution Research* in November 2015, signals that coal dust emitted in the Columbia River Gorge could cause potentially severe health consequences.

The study's findings are especially disquieting in light of the fact that two large coal export facilities have been proposed for Longview and Bellingham, Washington. Gateway Pacific Terminal at Cherry Point would be the largest coal facility in North America, capable of handling 48 million tons of coal per year. The Millennium Bulk Terminals at Longview plan to export 44 million tons of coal. If the proposals are successful, 17 more loaded open-topped coal trains per day would travel through the Columbia River Gorge. These open-top trains would litter the ground and air with coal

dust not only in the Gorge but in each area they travel through on the way to their destination, including Idaho, Spokane County, Eastern Washington, Skagit and Whatcom Counties, Snohomish County, King County, Tacoma and Olympia, and Southwest Washington. (As *The Oregonian* has pointed out, it's possible that coal trains would be routed through Oregon as well.) (RM Note: The DEIS has confirmed this.)

A massive quantity: Thousands of pounds over hundreds of miles

Coal is transported in uncovered hoppers, open-top rail cars that typically carry 100 to 120 tons of coal apiece. According to BNSF railway testimony before the Surface Transportation Board in 2009, an estimated 645 pounds of coal dust can escape from each rail car over the course of a 400-mile trip. Much of it accumulates on and near the railroad tracks, but wind and stormwater spread coal dust over larger areas of land and water.

Coal trains are inherently dirty, and there doesn't appear to be a viable fix. In non-peer-reviewed studies conducted by BNSF, the rail company claimed that shaping the coal like a loaf and applying chemical agents called surfactants to the top of the coal results in an 85 percent decrease in coal train dust. That means that even under a rosy scenario in which the coal loads remain somehow undisturbed during transit, the average single train car would still release a full 97 pounds of coal dust during its journey. For a 125-car coal train, that's 12,125 pounds over just 400 miles.

Even under good conditions, the average 125-car coal train would emit 12,125 pounds of coal dust over just 400 miles of rail travel.

But coal traveling to the proposed Washington terminals would travel a full 1,367 miles by rail, emitting even more coal dust. Nearly all the open-top coal trains observed by the Jaffe study emitted coal dust, even though the trains had already traveled more than 900 miles from the Powder River Basin in Wyoming and Montana to the site of the study.

Many factors can impact the hold of surfactant on coal, including high train speeds, wind speed, and rough handling during transport. Powder River Basin coal—the type that is transported through the Pacific Northwest—is particularly susceptible to breaking down, "virtually independent of how the coal is transported or handled," according to one handbook on coal analysis. In fact, four of the coal trains observed in the course of Jaffe's study emitted such large, visible plumes of coal dust that the study labeled them "super-dusters." If super-dusters pass through the Gorge at the same rate over the course of the year, that's about 24 super-duster trains passing through the region each year.

Dirty All Over by Aaron Hockley used under CC BY-NC-ND 2.0

A toxic quality: Diesel particulate matter and coal dust

The quantity of particulate matter is not the only concern; its composition is also particularly toxic. Consider what coal trains deliver to the rail-side communities they pass through. According to Oregon Physicians for Social Responsibility, diesel particulate matter (DPM) is a mixture of soot, black carbon, nitrogen, sulfur, metals, acids (such as sulfuric acid), and other toxic substances like polycyclic aromatic hydrocarbons (PAHs). These tiny particles travel deep into the lungs' alveoli, the smallest compartment of the lungs, where they enter the bloodstream and can contribute to various diseases in the lungs and other organs.

42% of fine particulate matter released by all trains in the Columbia River Gorge was black carbon.

The US Department of Health and Human Services and the World Health Organization identify particulate matter as carcinogenic to humans. Increased levels of particulate matter are associated with many ill health affects, including higher rates of asthma or worsening asthma; increased lung and breast cancer rates; lung, heart, and immune system abnormalities in children; higher rates of heart attacks and strokes; and higher childhood rates of neurodevelopmental disorders. The elderly, pregnant women, children, and people who already have lung diseases such as asthma are at special risk.

Diesel particulate matter (DPM) spews forth from the diesel engines of train locomotives, as well as ships and diesel trucks. A substantial amount of DPM is black carbon, the major component of soot, which absorbs and transports PAHs and other toxic compounds that contribute to heart and lung disease. Previous studies have found that black carbon makes up 45 to 52 percent of fine particulate matter (particles less than 2.5 micrometers in diameter, which are believed to pose the greatest health risks). The Jaffe study found that on average, 42 percent of fine particulate matter released by all trains in the Columbia River Gorge was black carbon.

The data collected by Jaffe and colleagues suggests that fine particulate matter emissions from coal trains are composed of approximately half diesel particulate matter and half coal dust. Coal dust, a powdered form of coal created by mining and transportation activities, introduces additional health concerns. Inhaling coal dust can lead to difficulty breathing, chronic bronchitis, and emphysema. It contains particulate matter including minerals such as silicates, which scar the lungs and reduce oxygen intake. (It's the same stuff that in enclosed environments like a mine causes black lung disease for an estimated 70 percent of coal miners during their lifetimes.)

Plus, according to the Washington Department of Health's comment letter on the proposed Gateway Terminal, coal dust contains lead, mercury, and arsenic. Lead and mercury are neurotoxins that affect the nervous system, and arsenic is a carcinogen linked to cancers of many organ systems. These toxins can enter the body through breathing in coal dust or eating food and fish harvested from land and water contaminated by coal

dust.

The public's chance to weigh in

Jaffe's coal dust study illustrates that the risks from coal dust blowing off trains are real, persistent, and dangerous. Enormous quantities of toxic coal dust and diesel particulate matter would cost communities all along the rail route from the Powder River Basin in Wyoming and Montana to the proposed export terminals on the coast at Longview and Bellingham.

This year, residents of the Pacific Northwest will get to see the first drafts of the official environmental reviews for these huge terminals. It's probably the last best chance for the public to voice their concerns about the proposals and the many ways that coal trains—and the dust they cough up all along their routes—put Northwest communities, land, and water at risk.

Health impacts from coal exports

coal: the dirtest of all fossil fuels

Coal transported through our communities would have negative health impacts on people living and working along the rail line, children and the elderly, individuals with underlying health conditions like asthma, chronic obstructive pulmanary disease, heart disease and diabetes, women over 50, and exposed workers.

> "Coal pollutants affect all major body organ systems and contribute to 4 of the 5 leading causes of mortality in the US: heart disease, cancer, stroke, and chronic lower respiratory diseases."
>
> — *Physicians for Social Responsibility (2009)*

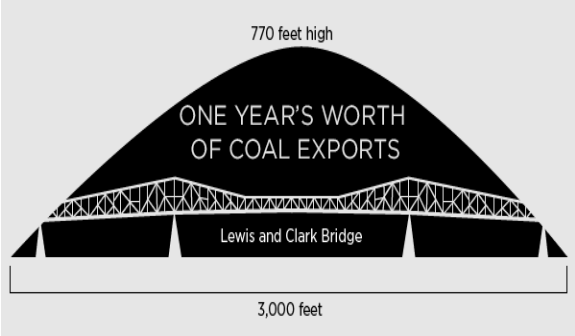
In Washington, more than 600,000 people have asthma. Nearly 120,000 of these are children.

Exposure to diesel emissions and coal dust would increase the health challenges faced by Washington families.

According to the Washington Department of Health (2016) :

- More than 5,000 people with asthma are hospitalized each year.
- Nearly 100 people die each year of asthma.
- The U.S. Centers for Disease Control and Prevention (CDC) identified Washington's asthma prevalence as among the highest in the nation, and steadily increasing.
- In 2010, hospitals charged about $73 million for asthma related hospitalizations.

> "Children are not little adults. They eat more, breath more, drink more per body weight than adults do, so the impact of health-related exposures is greater on them than on adults."
>
> - *Dr. Steven Gilbert*



THIS IS WHAT 44 MILLION TONS OF COAL LOOKS LIKE:

Contacts:

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Landowners and Citizens for a Safe Community
PO Box 2484 Longview, WA 98632 | LCSCdoingbetter@gmail.com

POWER PAST COAL
communities against coal export

Longview Coal Exp A Threat to Health and Safety

> "It is a cruel and bitter irony that our salmon is now contaminated with coal-derived mercury, one of the most powerful toxins to neural development—so that the intake of fish by pregnant woman and children needs to be limited."
>
> — *Dr. Martha Neuringer*

This proposal would transport coal through the Northwest for shipping and burning overseas.

This project presents a direct and local risk to the health and safety of Washington and Oregon residents

NEGATIVE HEALTH IMPACTS OF COAL TRAINS MOVING THROUGH OUR COMMUNITIES

Diesel particulate matter is associated with:

- Impaired pulmonary development in adolescents
- Increased cardiopulmonary mortality and all-cause mortality
- Measurable pulmonary inflammation
- Increased severity and frequency of asthma attacks, ER visits, and hospital admissions in children
- Increased rates of heart attacks in adults
- Increased risk of ischemic stroke
- Neurodevelopmental disorders

Coal dust is associated with:

- Chronic bronchitis
- Emphysema
- Pulmonary fibrosis (pneumoconiosis)
- Environmental contamination through the leaching of toxic heavy metals

Coal contaminates air, water and soil:

- Coal contains mercury, arsenic and lead
- When coal is burned in China, mercury, nitrous and sulfur oxides, ozone and heavy metals are carried by trade winds to the Northwest
- 18% of mercury concentrations in snowpack on Mt Bachelor are traced to Asian emissions; run-off contaminates fish, enters the food chain and harms health
- Coal dust and chunk pollution falling from trains also contaminates waterways with toxic heavy metals such as mercury
- Coal dust may damage crops and affect organic certification

Increased number of coal trains would:

- Delay emergency response times
- Increase accidents, injuries and deaths
- Increase potential for derailments and coal spills
- Increase risk of coal fires along rail routes and at storage facilities

Noise exposure causes:

- Cardiovascular disease, including increased blood pressure, arrhythmia
- Stroke and ischemic heart disease
- Cognitive impairment in children
- Sleep disturbance, hypertension, arrhythmia, and increased rate of accidents and injuries
- Exacerbation of mental health disorders

Take Action

Preventing the mining, transport and burning of coal would improve our health and safety.

- ✓ Share information about health impacts with family, friends and neighbors
- ✓ Attend and/or testify at public hearings
- ✓ Partner with local organizations and the Power Past Coal Coalition (contacts on other side)

Regna Merritt, PA – Oregon Physicians for Social Responsibility; Diane Winn, RN, MPH, Oregon Beyond Coal Health Outreach Committee, Sierra Club

Patricia Bellamy, RN, BS; Marilee Dea, MSRN, CPNP; Sharon Miller, MSW; Ali Shapiro, MS; Margo Salisbury, RN, MS, Oregon Beyond Coal Health Outreach Committee, Sierra Club

Oregon Interfaith Power & Light (3617)

Oregon Interfaith Power & Light

Generate the Future

May 24, 2016

Dear Cowlitz County Commissioners and Washington State Dept. of Ecology:

Please accept this testimony in opposition to allowing permits to go forward for the Millenium Bulk Terminals proposed for Longview, WA.

On December 9, 2015, the Board of Directors of Ecumenical Ministries of Oregon passed the attached resolution opposing the development of new fossil fuel infrastructure for reasons of public health, social justice, sustainability and environmental stewardship and climate change. Holding the draft EIS up against our values and what is known about the adverse impacts of coal trains and coal export terminals, we must oppose the project. Longview deserves better ways to provide living wage jobs. Sincerely, Jenny Holmes

Jenny Holmes
Environmental Ministries Director

0245 SW Bancroft St., Suite B ■ Portland, Ore. 97239 ■ *phone* (503) 221-1054, ext. 214 or 210 ■ *fax* (503) 223-7007 ■ *Web site* www.emoregon.org

Oregon Interfaith Power & Light is a project of Ecumenical Ministries of Oregon

May 24, 2016 submitted to the Cowlitz County Commissioners and Washington Department of Ecology

Oregon Interfaith Power & Light (3617)

New Fossil Fuel Export Infrastructure— A Call to a Higher Road for the Pacific Northwest

An Open Letter of Pacific Northwest Elected Officials, Cities and Agencies from People of Faith in the Pacific Northwest.

The Pacific Northwest is a special place of beauty and natural abundance. From deserts to shores of the Pacific, from mountains to fertile valleys, we are blessed by the Creator to call this place home. For over two decades, the idea of the Pacific Northwest serving as global model of a green economy that supports both people and nature has been an inspiration to many throughout the world. Among people of faith, a vision for the well-being of humankind together with nature has been expressed as "Shalom," "eco-justice (ecological and economic justice)," and more recently by Pope Francis in his encyclical as "integral ecology," which connects care of the natural world with justice for people, especially the most vulnerable. The push by the fossil fuel industry to turn our lands and waters into sacrifice zones for fossil fuel export threatens much that we value.

The Pacific Coast, from British Columbia to California, stands between large deposits of fossil fuel of the North American interior and Asian energy markets. A cultural and moral shift in the way that fossil fuels are viewed and new policies to limit pollution from the burning of fossil fuels domestically has fueled a search for new markets. Pacific Coast ports are the only way to get these fuels to Asian markets. Proposed fossil fuel export projects and transportation threaten sacred sites and treaty fishing areas of Native peoples, put communities in danger of explosive fires and toxic discharges into air, land and water; bring added pollution and noise to low-income communities along train routes, reduce transport capacity for other essential goods such as agricultural products, and foreclose other, more sustainable uses for lands and transportation corridors.

The extraction of these fossil fuels, including Bakken shale, Alberta tar sands and Power River Basin coal pollute and scar the land. Social disruption and human exploitation increase in extraction areas. The social and environmental costs of extraction for these fossil fuels are not reflected in export market prices.

When burned, these fossil fuels warm the climate and their pollutants, such as mercury, return to the Northwest on trade winds. As people of faith, we believe that climate change is one of the greatest moral and spiritual concerns of our time. We believe that our region must reject new fossil fuel export projects now and move without delay in the direction of renewable energy and a green economy that provides opportunity for all, and supports the health and well-being of human communities and all Creation.

Proposed fossil fuel infrastructure to store and export greatly increased volumes of fossil fuels through the Pacific Northwest is deeply out of alignment with our values as people of faith and as residents of the Pacific Northwest. Proposed fossil fuel infrastructure currently includes 27 projects such as the Bulk Millennium Plant Terminal at Cherry Point (Bellingham, WA); Tesoro Savage: Vancouver Energy Distribution Terminal (Vancouver, WA); NuStar Energy: Vancouver Energy Project (Vancouver, WA); Jordan Cove Liquefied Natural Gas Terminal (Coos Bay, OR).

A Call to Action

We call upon all cities, state governments and port authorities of the region to follow the lead of the Portland City Council in calling for a halt to the building of new fossil fuel export infrastructure. If the entire fossil fuel export infrastructure proposed was to be built, it would be roughly equivalent the fossil fuel burned from five Keystone XL Pipelines. As people of faith, we will stand behind leaders who want to leave behind a legacy of a prosperous, healthy region and world.

Whereas, the Pacific Northwest is a special place of beauty and natural abundance. From deserts to shorelines and the Pacific Ocean, from mountains to fertile valleys, we are blessed by the Creator to call this place home. For over two decades, the idea of Pacific Northwest serving as global model of a green economy that supports both people and nature has been an inspiration to many throughout the world.

Whereas, among people of faith, a vision for the well-being of humankind together with nature has been expressed as "Shalom," "eco-justice (ecological and economic justice)," and more recently by Pope Francis in his encyclical as "integral ecology" which connects care of the natural world with justice for people, especially the most vulnerable.

Whereas, the push by the fossil fuel industry to turn our lands and waters into sacrifice zones for export of fossil fuels including coal, threatens much that we value.

Whereas, the Pacific Coast, from British Columbia to California, stands between large deposits fossil fuel of the North American interior and Asian energy markets. A cultural and moral shift in how fossil fuels are viewed and new policies to limit pollution from the burning of fossil fuels in the United States has fuel a search for new markets. Pacific Coast ports are the only way to get these fossil fuels to Asian markets.

Whereas, proposed fossil fuel export projects and transportation threaten sacred sites and treaty fishing areas of Native peoples, put communities in danger of explosive fires and toxic discharges into air, land and water; bring added pollution and noise to low-income communities located along train routes, reduce transport capacity for other essential goods such as agricultural products, and foreclose other, more sustainable uses for lands and transportation corridors.

Whereas, the extraction of these fossil fuels, including Bakken shale, Alberta tar sands and Power River Basin coal pollute and scar the land. Social disruption and human exploitation increase in extraction areas. The social and environmental costs of extraction for these fossil fuels are not reflected in export market prices.

Whereas, when burned, these fossil fuels warm the climate and their pollutants such as mercury return to the Northwest on trade winds. As people of faith, we believe that climate change is one of the greatest moral and spiritual concerns of our time.

Whereas, we believe that our region must reject fossil fuel export projects, now, and move without delay in the direction of renewable energy and a green economy that provides opportunity for all, and supports the health and well-being of human communities and all Creation.

Whereas, proposed fossil fuel infrastructure to store and export greatly increased volumes of fossil fuels through the Pacific Northwest is deeply out of alignment with our values as people of faith and as residents of the Pacific Northwest. Proposed fossil fuel infrastructure currently includes 27 projects such as the Bulk Millennium Plant at Cherry Point (Bellingham, WA) Tesoro: Vancouver Energy Distribution Terminal (Vancouver, WA), NuStar Energy: Vancouver Energy Project (Vancouver, WA), Jordan Cove Liquefied Natural Gas Terminal (Coos Bay, OR).

Be it therefore resolved that the board of EMO call upon all cities, state governments and port authorities of the region to follow the lead of the Portland City Council in calling for a halt to the building of new fossil fuel export infrastructure. If the entire fossil fuel export infrastructure proposed was to be built, it would be roughly equivalent the carbon equivalent of fossil fuels burned from five Keystone XL Pipelines.

Be it further resolved that as people of faith, we will stand behind leaders, willing to leave behind a legacy of a prosperous, healthy region and world by taking leadership to halt new fossil fuel export infrastructure.

-Passed December 9, 2015

Board of Directors, Ecumenical Ministries of Oregon

Submission Number: ***TRANS-LV-M1-00039***

Received: 5/24/2016 12:00:00 AM
Commenter: Patricia Belomy
Organization: Oregon Nurse's Association
State: Oregon

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Patricia Belomy. I live in Northeast Portland. I'm a member of the Oregon Nurse's Association ONA. ONA was founded in 1904 as a professional association for Oregon nurse. ONA is currently represented by over 10,000 Oregon nurses. I want to share ONA's position on the coal exports in the Pacific Northwest. First I'll read from the 2014 News Release to Governor Kitzhaber, and secondly from a letter from ONA to current Governor Kate Brown in August of 2015. And I quote, Based on research indicating dust emitted during transport of coal contains heavy metals that can cause multiple health conditions, including heart attacks, strokes, asthma, chronic bronchitis and emphysema. ONA expresses full support to Governor Kitzhaber's decision of no coal exports, and calls for Governor Kitzhaber to apply his leadership to ensuring that coal export permit applications are defied, and that coal is not transported through Oregon or along right-of-ways adjacent to Oregon. In 2015 ONA sent a letter to current Governor Brow reading in part, and I quote, ONA is continuing to work opposing projects that would increase coal transportation in Oregon. As a front line member of our health care system, nurses are concerned about the negative health and environmental impacts caused by coal. Thank you for your support and leadership on this issue. And in the end, nurses know the real safety and health risks to our citizens and communities from these mile-long, uncovered, diesel driven coal trains. Please consider the voice of these knowledgeable care givers. Thank you.

Submission Number: ***TRANS-LV-M1-00001***

Received: 5/24/2016 12:00:00 AM
Commenter: Dr. Andy Harris
Organization: Oregon Physicians for Social Responsibility
State: Oregon

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Yeah, my name is Dr. Andy Harris. I'm a North Portland physician in Multnomah County. I'm speaking on behalf of Oregon Physicians for Social Responsibility.

The draft EIS raises serious health concerns about the impact of 16 covered and uncovered coal trains per day passing through our communities in the Northwest. A health impact assessment is needed to determine how much diesel particulate matter will people be exposed to living at various distances from the tracks. The diesel exhaust we know causes asthma, heart disease, stroke. It exacerbates COPD, and is a known carcinogen.

What is the economic impact of emergency room visits in hospitalizations and who will pay for these costs?

Coal dust contains toxic metals like mercury, lead, arsenic, and cadmium. What are the estimated effects of chronic exposure to these compounds on neonatal and childhood development, including autism, ADHD, learning disabilities, et cetera. What is the impact of noise pollution, the excessive rumbling of heavy trains and piercing whistles on living within earshot of the tracks, causing sleep disorders, anxiety, depression, hypertension, and heart disease?

What about delays in emergency medical services, police and fire when grade level crossings are closed for five to seven minutes for coal trains that are over a mile and a quarter in length?

How many rail crossing accidents, injuries, and deaths will be attributed to this increased rail traffic? My time is almost up.

So I would just like to in summary say that we really don't know what the impact of 44 million tons of coal per year are going to have on the environment. Surely it is not going to help climate change. And I would urge the committee and those who are represented here to select the no action alternative on the Final EIS. Thank you.

EVENT HOST: If you have any written comments, you're welcome to leave them here with Cesar. Next speaker.

Submission Number: ***TRANS-LV-M1-00027***

Received: 5/24/2016 12:00:00 AM
Commenter: Dr. Patrick O'Herron
Organization: Oregon Physicians for Social Responsibility
State: Oregon

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hi. My name is Dr. Patrick O'Herron. I live in Portland, Oregon, work as a general surgeon, and I'm the president of Oregon Physicians for Social Responsibility. I represent over 2,000 health care professionals and public health advocates in calling for the no action alternative on the basis of protecting public health. The human impacts of exposure to particulate matter include cancer, cardiovascular and respiratory diseases, and they accumulate with increasing exposure. According to the World Health Organization, and I quote, Small particulate pollution has health impacts even at very low concentrations. Indeed no threshold has been identified below which no damage to health is observed. The WHO guidelines for particulate matter are in fact lower than the U.S. National Ambient Air Quality Standards seen in the Draft Environmental Impact Statement. If we apply the WHO guidelines to, for instance, the estimated maximum PM-10 and 2.5 concentrations under BNSF main lines in Cowlitz County as seen in Table 5.7-6, and for Washington, as seen in Table 5.7-9, we see that more than half of the Model of Emissions profile exceeds the guidelines with several just squeaking by. While the Model of Emissions of PM-10 and 2.5 generally fall below federal standards, many fail to meet World Health Organization guidelines and they will certainly have negative health consequences. So it's puzzling to read the Air Quality Impact Statement that 5.7.5 which says overall the impacts of PM-10 and PM 2.5 Emissions with proposed action related to rail transport, coal would not be significant because emissions would be below the act of federal standards. This is just one example of how the Draft EIS is weak regarding human health. A comprehensive impact assessment is needed which examines not only the cancer risk but also increase in respiratory, cardiovascular, and cerebral vascular disease. Thank you.

OREGON WILD

9 June 2016

TO: U.S. Army Corps, Washington Dept of Ecology, Cowlitz County
VIA: https://public.commentworks.com/cwx/mbtldeiscommentform
https://public.commentworks.com/cwx/mbtldeiscommentform/

Subject: Millennium Bulk Terminals Longview Coal Export DEIS — comments

Dear US Army Corps of Engineers, WA Dept. of Ecology and Cowlitz County:

Please accept the following comments from Oregon Wild concerning the Millennium Bulk Terminals Longview Coal Export DEIS, http://www.millenniumbulkeiswa.gov/, https://public.commentworks.com/cwx/mbtldeiscommentform/. Oregon Wild represents over 15,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy.

Mining, export, and use of coal is simply not in the public interest. Oregon Wild therefore urges you to adopt the "no action" alternative in the Millennium Bulk Terminals FEIS & Record of Decision.

Millennium's proposed coal export terminal would harm communities throughout the Northwest, including sites where coal is mined, transported, and with the most intense impacts felt in Longview, Washington, near the proposed export terminal site. The project harms public health and safety, air and water quality, natural resources, and of course the climate upon which humans and all other ecosystems depend. Oregon Wild urges your agencies to protect public health and natural resources by rejecting coal export.

Climate Change: Coal is the single biggest source of climate changing CO2 pollution on earth. Fossil fuels are the biggest problem, and coal is the worst offender among fossil fuels. We urge decision-maker sot recognize that CO2 has a very long residence time in the atmosphere. The severe climate impacts of your decisions today will affect many generations to come.[1] Thinking people agree that solving the climate crisis requires that we leave fossil fuels, and especially coal, in the ground, so it cannot contribute to the climate crisis. See Lashof et al 2007. Coal in a

[1] "Using a combination of various methods, researchers have estimated that about 50 percent of the net anthropogenic pulse would be absorbed in the first 50 years, and about 70 percent in the first 100 years. Absorption by sinks slows dramatically after that, with an additional 10 percent or so being removed after 300 years and the remaining 20 percent lasting tens if not hundreds of thousands of years before being removed." http://www.yaleclimateconnections.org/2010/12/common-climate-misconceptions-atmospheric-carbon-dioxide/

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Changing Climate. NRDC. https://www.nrdc.org/sites/default/files/coalclimate.pdf Northwest states are national leaders in the fight to combat climate change. Considering rail and vessel emissions alone, this project would be one of the biggest greenhouse gas emitters in Washington state. Coal export undermines the state's hard work to combat climate change and protect future generations. Exporting coal will just perpetuate and increase dependence on the worst possible source of energy. Climate change is a global problem that requires rapid global reduction of greenhouse gas emissions. Exporting coal is simply inconsistent with this urgent need. Oregon Wild urges our leaders to work for a swift global transition to renewable, non-fossil energy supplies.

Health & the Environment: The Draft EIS reveals many serious impacts to human health and the environment. It dismisses other impacts without a valid basis. The Final EIS should incorporate the best available science, real world examples, and a comprehensive Health Impact Assessment. The agencies undercut public, tribal, and agency input by failing to complete a Health Impact Assessment before releasing the Draft EIS.

- Coal is directly responsible for a wide range of serious health impacts including lung ailments, heavy metal exposure, and low birth weight. These impacts have been born by individuals and communities through increased suffering, disease, and health care costs. If health and environmental damages were included in the price of coal, it would triple the cost of electricity for U.S. consumers. Yet the full impact of coal is not felt on wallets, it is born by the health of individuals and communities. https://noharm-uscanada.org/sites/default/files/documents-files/3169/Coal%20Divestment%20White%20Paper_0.pdf
- Coal mining destroys ecosystems, releases toxic levels of minerals and gasses into our water and air (including the potent greenhouse gas methane) and exposes miners and those who live nearby to coal dust and other toxins. Thousands of people die in mine collapses around the world every year.
- Beside CO2, coal combustion releases millions of tons of sulphur dioxide and nitrogen oxides into the air, which create acid rain and smog.
- Coal burning also yields particulate matter pollution, which creates air pollution and respiratory ailments, among other health problems.
- Another by-product of burning coal is mercury, which infiltrates the food chain and attacks the human nervous system. Young children and babies, whose nervous systems are still developing, are especially vulnerable.
- Burning coal creates millions of tonnes of waste products that contain toxic levels of heavy metals and minerals. These mostly end up in landfill sites or impoundments, and pose a threat to our health and environment.

Greenpeace 2010. The Case Against Coal. http://www.greenpeace.org/international/en/campaigns/climate-change/coal/The-case-against-coal/

Rail Traffic: The Draft EIS demonstrates Millennium would have a severe impact on rail and road congestion. Because Millennium cannot fix this significant harm—from mine to terminal—

the agencies should deny permits. “Transporting coal from where it is mined to where it will be burned also produces significant quantities of air pollution and other environmental harms. … Almost 60 percent of coal in the United States is transported at least in part by train, with coal transportation accounting for 44 percent of rail freight ton-miles. 66 Coal trains some of which reach more than two miles in length, cause railroad-crossing collisions and pedestrian accidents (there are approximately 3,000 such collisions and 900 pedestrian accidents every year) and interruption in traffic flow (including disruption to emergency responders such as police, ambulance services, and fire departments).” Lashof et al 2007. Coal in a Changing Climate. NRDC. https://www.nrdc.org/sites/default/files/coalclimate.pdf.

Inadequate & Unenforceable Mitigation: In some instances, the Draft EIS claims mitigation can reduce coal dust, rail traffic, and other impacts of this coal export project. For example, to mitigate coal dust from the terminal, the Draft EIS proposes a reporting process for coal dust complaints. This is grossly inadequate. A phone call or email to complain about coal dust fouling a person’s lungs, home, and river is not “mitigation.” The agencies should revise the Draft EIS and remove inadequate, unsupported, and unenforceable mitigation.

Sincerely,

Doug Heiken
dh@oregonwild.org

June 13, 2016

Cowlitz County and Washington State Department of Ecology
Comments e-filed via CommentWorks

Re: SEPA Draft Environmental Impact Statement for Millennium Bulk Terminals-Longview Coal Export Terminal

To Whom it May Concern:

The proposed construction and operation of a new coal export terminal near Longview (Millennium Bulk Terminals) is inconsistent with Washington law, poses significant threats to human health, safety, and welfare, and would contribute to catastrophic and irreversible environmental impacts. Cowlitz County and Washington State Department of Ecology ("Ecology") ("Lead Agencies") should not approve the Millennium Bulk Terminals Longview coal export terminal.

A Washington Superior Court found that young Washingtonians' "very survival depends upon the will of their elders to act now, decisively, and unequivocally, to stem the tide of global warming by accelerating the reduction of emission of GHG's before doing so becomes first too costly and then too late."[1]

Despite this, the Lead Agencies are considering approving a coal export terminal that would endanger public health and safety and contribute to catastrophic and irreversible environmental impacts. The release of carbon dioxide emissions, which would further destabilize the climate system and worsen ocean acidification will have perilous consequences for all Washingtonians and United States citizens. The Draft Environmental Impact Statement (DEIS) fails to consider these extremely dangerous impacts.

[1] *Foster v. Wash. Dep't of Ecology*, No. 14-2-25295-1 SEA, 5 (Wash. Super. Ct. Nov. 19, 2015), *available at* http://ourchildrenstrust.org/sites/default/files/15.11.19.Order_FosterV.Ecology.pdf.

It is also important to note that Washington's greenhouse gas emission reduction goals would be severely compromised, and likely impossible to meet, if the project were to be approved. According to RCW 70.235.020, Washington has set the goals of reducing GHG emissions to 1990 levels by 2020 and fifty percent below 1990 levels by 2050, which co-lead agency Ecology has admitted (in its December 2014 Report) do not reflect the current science and need to be updated. The DEIS does not explain how the project is consistent with these GHG reduction goals, and indeed, it is hard to imagine how Washington would be able to come close to meeting these goals if this export terminal, that would emit a tremendous amount of greenhouse gases (GHGs) (37.6 million metric tons of CO_2e over 20 years), were approved.

Global warming of Earth's surface and our oceans, the resulting climate destabilization, and the ocean's uptake of excessive carbon dioxide leading to their acidification is unequivocally caused by human activities (primarily fossil fuel carbon emissions) and has been and continues to be permitted, authorized, facilitated, funded, encouraged, incentivized and in other ways allowed by the Washington government. As the 2014 National Climate Assessment report confirms, climate change is leading to an increase in extreme weather events, which are causing serious damage to American lives across the country, from record heat, to record flooding, to record droughts and wildfires, even with only .8-.9 ° C of surface warming over pre-industrial temperatures. Even more heat is stored in our oceans. Threats to our oceans, agriculture, water supplies, shorelines, forests, wildlife, homes, and communities increase every year our government fails to take significant science-based actions to address global climate change. Every decision made today implicating climate change and ocean warming and acidification needs to be evaluated in light of a comprehensive climate recovery plan and the government's constitutional and public trust obligation to the citizenry, present and future.

We are confronted with an atmospheric emergency, and reducing carbon dioxide emissions to mitigate the disastrous impacts of climate destabilization and ocean acidification is one of the most urgent matters before Washington's environmental decision-makers. Timing and rates of emission reductions are critically important, and must be in line with a plan to achieve atmospheric health and climate recovery according to the best available science. Piecemeal regulatory and agency decisions that are not tiered to defensible science-based standards for atmospheric, climate, and ocean restoration will never meet the urgent job of our time, and the most core function of government—to keep us safe and protect our lives, liberties, and property.[2] This project presents the classic "death by a thousand cuts" result of state decision-making when

[2] *See* Amended Complaint in *Kelsey Cascadia Rose Juliana, Xiuhtezcatl Tonatiuh M., et al. v. The United States of America, Barack Obama, et al.,* No.: 6:15-cv-01517-TC (D. Or. 2015) *available at* http://ourchildrenstrust.org/sites/default/files/YouthAmendedComplaintAgainstUS.pdf; *see also A Climate of TRUST*, http://www.ourchildrenstrust.org/trust-films/AClimateOfTRUST.

made in a vacuum, in the absence of standards and a complete cumulative impacts analysis against that standard of protect. It is unlawful.

The proposed Millennium Bulk Terminals would commit us to unleashing decades more greenhouse gas (GHG) pollution—from the terminal construction, operations, and transportation emissions. Thus, approving the Lead Agencies' proposal would be an abrogation of the Lead Agencies' constitutional public trust obligation and a violation of Washingtonians' fundamental and inalienable rights to use essential natural resources, like air and water, without having those public resources substantially impaired. The entire coal export terminal project is an additional cumulative lethal threat to the rights of present and, especially, future generations to their natural rights, including their peace, safety, and happiness—rights secured by Washington's Constitution—as well as their rights to a healthy atmosphere and stable climate. Unabated fossil fuel emissions, including those that will result from this project and related, interdependent projects, and the consequent climate destabilization, threaten the human race and numerous other forms of life on Earth.

We hereby incorporate all hyperlinked documents in the footnote citations into these comments and the administrative record for this project. If you require PDF or hard copies of any of the hyperlinked documents, please let us know and we will supply them; otherwise we will assume that the Lead Agencies can access and include them in the record via the internet.

The Lead Agencies and Cooperating Agencies have Public Trust and Constitutional Obligations to Protect the Atmosphere and Create a State Climate Recovery Plan

1. According to the Public Trust Doctrine, which is embedded in Washington's Constitution and in the very sovereignty of our State, all Washingtonians (both present and posterity) have a right to use and access sustainable trust resources for their peace, safety, and happiness. That right belongs not just to present generations, but to Posterity (future generations) as well. Indeed they are the largest majority and the future of this nation.[3]

2. To uphold citizens' rights, state governments (as well as the United States government) have fiduciary duties as trustees to manage and protect our country's

[3] *See Foster v. Wash. Dep't of Ecology*, No. 14-2-25295-1 SEA (Wash. Super. Ct. Nov. 19, 2015*); see also Stories of TRUST: Calling for Climate Recovery,* a mini-documentary film series depicting young Americans whose lives are already being impacted by climate change and who are calling on their government trustees to take urgent action to prepare and implement comprehensive Climate Recovery Plans that will achieve a safe atmosphere for their generation and those to follow. http://ourchildrenstrust.org/trust-films.

vital natural resources in trust for present and future generations of citizens.[4] The Lead Agencies and all of the executive agencies (both state and federal) involved in the environmental review process of the proposed project share these obligations.

3. Under the Public Trust Doctrine, the Lead Agencies and cooperating agencies have a fiduciary obligation to protect the atmosphere from the effects of human-induced global energy imbalance. The Lead Agencies and cooperating agencies may not manage the trust resource in a way that substantially impairs the atmosphere, the climate system, our oceans or water supply, or the public interest in a healthy atmosphere.[5]

4. If the Lead Agencies and cooperating agencies, as trustees of the atmosphere, do not take immediate effective action to protect, preserve, and restore the atmosphere back into balance; our children, future generations, and innumerable species will continue to suffer greater injury and damaging consequences.[6] Significantly, fundamental constitutional rights of young people will be irreparably violated.

5. Science must define the fiduciary obligation that our state authorities, as trustees, must fulfill under the Public Trust Doctrine and Washington's Constitution. Earth has already heated over pre-industrial temperatures to levels that have substantially impaired our natural systems and if allowed to rise further will threaten the habitability of Earth for the human species. Rapid reduction of greenhouse gas (GHG) emissions is required to preserve a habitable climate for present and future generations. Thus, in order to protect our essential natural systems, the best available science demonstrates that our atmosphere must be returned to an equilibrium of less than 350 parts per million ("ppm")[7] carbon dioxide to prevent long-term heating

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[4] *See Foster v. Wash. Dep't of Ecology*, No. 14-2-25295-1 SEA (Wash. Super. Ct. Nov. 19, 2015).
[5] *See Foster v. Wash. Dep't of Ecology*, No. 14-2-25295-1 SEA (Wash. Super. Ct. Nov. 19, 2015).
[6] *See* Expert Declaration of James Hansen in Support of Plaintiffs in *Kelsey Cascadia Rose Juliana, Xiuhtezcatl Tonatiuh M., et al. v. The United States of America, Barack Obama, et al.,* No.: 6:15-cv-01517-TC (D. Or. 2015), *available at* http://ourchildrenstrust.org/sites/default/files/15.08.12.HansenExpertDecSupportingYouth.pdf; James Hansen, et al., *Assessing 'Dangerous Climate Change': Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature*, PLOS ONE 8:12, e81628 (2013) [hereinafter *Assessing 'Dangerous Climate Change'*], *available at* http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0081648; James Hansen, et al., *Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2 C global warming is highly dangerous*, 16 Atmos. Chem. Phys. Discuss., 3761-3812 (2016), *available at* http://www.atmos-chem-phys.net/16/3761/2016/acp-16-3761-2016.pdf.
[7] The Status Review Report notes that "Some experts have suggested that atmospheric CO_2 levels must be reduced to those found in the 1970s (below 340 ppm and perhaps as low as 320 ppm) to maintain healthy coral growth over the long term (Veron et al., 2009)." Russell E. Brainard, et al., Status Review Report of 82 Candidate Coral Species Petitioned Under the U.S. Endangered Species Act 52 U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-27 (2011).

beyond 1° C (1.8° F), which scientific analysis deems catastrophic.[8] Our atmosphere now has carbon dioxide concentrations of over 404 ppm, which constitutes substantial impairment.[9] **If the Lead Agencies or any cooperating agency disagrees with this safe standard for atmospheric carbon dioxide levels or for a maximum increase in global surface temperature that should be allowed, please so state in your response to these comments. Please provide your analysis for what standard should be applied, your reasoning, scientific support for that standard, and a comprehensive analysis of what present and future generations of Washingtonians should expect to result from that standard in terms of impacts to their lives, liberties, and property, as well as overall impacts to the ecosystems across our state and nation, in full compliance with SEPA.**

6. To fulfill their constitutional public trust obligations, the Lead Agencies and cooperating agencies, as trustees, must work collectively with other state departments and agencies to prepare and implement a Climate Recovery Plan based on the best available science to manage and protect trust resources for the continued benefit of present and future generations of citizens.

7. The Climate Recovery Plan must place limits on Washington's carbon emissions, while also promoting massive reforestation programs, and must be tiered to bringing the carbon concentration in the atmosphere back to 350 ppm by the end of the century.[10]

8. The Plan must be developed and implemented immediately. Significant delay will compound the difficulty of administering a regulatory program to achieve necessary emissions reductions.[11]

9. Any and all analysis of the Climate Recovery Plan must be evaluated in the context of all Washington carbon emissions in order to assess whether emission limits are in line with the need to reduce emissions by at least 8% per year (and increasing to 15% per year reductions if we wait until 2020), according to James Hansen, et al.'s best science on achieving 350 ppm by 2100.[12]

10. As part of their fiduciary duties as trustees to manage and protect our state's vital natural resources, the Lead Agencies and all of the executive agencies involved in the environmental review process of the proposed project have the duty of loyalty to

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[8] *See* Hansen, et al., *Assessing 'Dangerous Climate Change.'*
[9] U.S. Department of Commerce, National Oceanic & Atmospheric Administration, Earth System Research Laboratory, *Trends in Atmospheric Carbon Dioxide*, http://www.esrl.noaa.gov/gmd/ccgg/trends/global.html (last visited June 13, 2016).
[10] *See* Hansen, et al., *Assessing 'Dangerous Climate Change.'*
[11] *See* Hansen, et al., *Assessing 'Dangerous Climate Change.'*
[12] *Id.*

administer the trust solely in the interest of the trust beneficiaries—both present and future generations of citizens.[13]

Based on the Best Science and Evidence, A Climate Recovery Plan Calibrated to Standards of Protection Must Precede Approval of the Proposed Project and the Lead Agencies Must Address the Direct, Indirect, and Cumulative Impacts of GHG Emissions and Climate Change.

11. The Lead Agencies' decision on whether to approve the proposed project must be preceded by a Climate Recovery Plan. The Climate Recovery Plan ensures annual emission reductions calibrated to the 350 ppm trajectory will be achieved and details how they will be achieved. Allowing the proposed project, which would result in significant GHG emissions, outside a plan for protecting the atmosphere in trust for present and future generations, would be a violation of the Washington Constitution and Washington's public trust responsibility to our posterity, and of SEPA.

12. In the DEIS, the Lead Agencies and cooperating agencies failed to adequately consider the best science and evidence in evaluating the proposed project's impacts on the growing climate crisis and ocean acidification. In particular, Dr. Hansen's paper discussed above, *Assessing 'Dangerous Climate Change': Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature*, should have been included.[14] The science and other best evidence presented and included in these comments and the attachments should be fully considered in the Lead Agencies' and any cooperating agency's analyses for the approval of the Longview coal export terminal.

13. When there is incomplete or unavailable information, the Lead Agencies and cooperating agencies should take a precautionary approach.
14. In the DEIS, the Lead Agencies and cooperating agencies have failed to adequately consider the direct, indirect, and cumulative impacts of the proposed project and of alternatives that could reduce or eliminate those environmental impacts. In particular, the Lead Agencies have failed to account for the carbon emission, climate, and ocean acidification impacts to already impaired resources over the lifespan of the project. There is no accounting of the lifespan emissions resulting from the project and all that it facilitates, including construction, operations, and transportation from the Powder River Basin and the Uinta Basin and to Asia. Nor is there any analysis of these cumulative lifespan emissions measured against the Washington's obligation to its citizens to reduce emissions in line with the science to protect life, liberty and property from the lethal threat of fossil fuel emissions to our natural life-sustaining

[13] *See Robinson Twp. et al. v. Commonwealth of Pa.*, 83 A.3d 901, 957 (Pa. 2013).
[14] *See* Hansen, et al., *Assessing 'Dangerous Climate Change.'*

systems and human civilization.

15. The Lead Agencies' DEIS should quantify and analyze the impact of increased atmospheric concentration of GHGs over the lifespan of the project that is caused/enabled by the proposed project. Specifically, the Lead Agencies can calculate how additional CO_2 concentrations further imbalance the Earth's energy system in terms of kilowatt hours per square meter.[15] The Lead Agencies can calculate the total metric tons of carbon dioxide Oregon should be decreasing on an annual basis to return to the 350 ppm prescription by 2100, the best science on climate recovery, and how this project affects those necessary reductions over the lifecycle of the project. If the Lead Agencies do not have enough information, then it may not approve the project, and must obtain the information necessary to make a full disclosure and analysis and ensure for Washingtonians and our posterity their rights to life, liberty and property.

16. In assessing the proposed project's impact on the atmospheric concentration of GHGs, the Lead Agencies' and cooperating agencies should consider both the indirect and cumulative GHG emissions from the proposed project. In considering indirect and cumulative impacts, the Lead Agencies failed to analyze any delayed or incremental impacts of the increased GHG emissions caused by the proposed project. Disclosing an estimate of annual emissions from the project itself does not suffice. The Lead Agencies must disclose total emissions over the life span of the project from the construction, operations, and transport associated with the terminal. Once it discloses that figure, the Lead Agencies must do an actual analysis of those emissions, added to all other cumulative emissions beyond 350 ppm and the additional harm to the human environment. To make this analysis meaningful, please answer these questions:
    a. What do the Lead Agencies or the State use as a maximum global warming temperature goal for the most heating to the Earth's surface and our oceans that is safe for humanity and other living organisms, including human life, liberty and property?
    b. What do the Lead Agencies or the State use as a maximum atmospheric carbon dioxide concentration level that is safe for humanity and other living organisms, including human life, liberty, and property?
    c. What plan for restoring our atmosphere to safe levels of carbon dioxide, and our planet to safe temperatures do the Lead Agencies use as a basis for conducting its cumulative impacts analysis?

17. In assessing the proposed project's impact on the atmospheric concentration of GHGs, the Lead Agencies and cooperating agencies must consider the GHG emissions from the entire lifecycle of the gas associated with the proposed project,

[15] *See* Hansen, et al., *Assessing 'Dangerous Climate Change.'*

which includes the exploration, extraction, production, transportation, shipment and combustion of the gas.

18. The Lead Agencies must consider transboundary impacts from the proposed project, including GHG emissions from the construction, operations, transport from transportation from the Powder River Basin and the Uinta Basin, and to end use transport to Asian markets.

19. Scientists agree that emission levels this decade will determine our fate and may push us beyond tipping points from which we cannot return. Time is of the essence.[16] The DEIS does not explain how the cumulative GHG emissions from the proposed project, and the related projects that depend on it, will affect the state's response to the urgency of the crisis and the need to reduce emissions at sufficient levels to avoid unsafe levels of heating and further acidification of our oceans.

20. The Leading Agencies and cooperating agencies must analyze the cumulative impact of life cycle GHG emissions of all federally-approved fossil fuel development, transportation, and export projects and any other state action that results in the increased concentration of GHGs in the atmosphere (e.g., timber sale). The Lead Agencies failure to fully evaluate the cumulative impacts of the proposed project's life cycle GHG emissions combined with the GHG emissions from other state actions is a violation of SEPA and the Lead Agencies' constitutional public trust obligations. As noted by the Ninth Circuit in *Center for Biological Diversity v. NHTSA*, "the fact that climate change is largely a global phenomenon that includes actions outside of the agency's control does not release the agency from the duty of assessing the effects of its actions on global warming within the context of other actions that also affect global warming."[17]
21. Specifically, the Lead Agencies must evaluate the dozens of Pacific Northwest fossil fuel projects as part of a program to open up global markets for U.S. fossil fuel and the cumulative impacts of that export program.

The DEIS Fails to Address the Following Impact Issues Based on the Best Science and Evidence.

22. How much atmospheric carbon dioxide is safe for oceans and will additional carbon dioxide released as an effect of the proposed project further impact and harm oceans? Scientists say that carbon dioxide levels higher than 350 ppm are dangerous for our oceans.

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[16] *See* Hansen, et al., *Assessing 'Dangerous Climate Change.'*
[17] *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1217 (9th Cir. 2008) (emphasis in original) (alterations and internal quotation marks omitted).

23. How much surface temperature warming is safe for oceans and will additional carbon dioxide released as an effect of the proposed project further impact and harm oceans? Scientists say that current levels of ocean warming are already harming marine life and causing significant melting, including the West and East Ice Sheet of Antarctica, which are irreversibly on their way to collapse due to ocean warming.

24. We have already lost significant ocean productivity (i.e. food supply potential and ecological function) due to GHG emissions, which have caused acidification and warming and will additional emissions as an effect of the proposed project further impact and harm ocean productivity and economic benefits. This is not analyzed in the DEIS.

25. The DEIS should address how much surface temperature warming would be safe to avoid dangerous melting of ice sheets, glaciers and permafrost, which would release methane and will additional carbon dioxide released as an effect of the proposed project further threaten our ice resources.

26. Do the Lead Agencies have any evidence to show that this project, and the related projects that depend on it, will not cumulatively press warming past tipping points of no return? And how would that tipping point be quantified in terms of GHG emissions and CO_2 levels?

27. If Arctic communities need to relocate because of melting ice and sea level rise and severe storms and flooding, doesn't that establish unacceptable risk? It presents considerable risk to present generations and eliminates the prospects of continued habitation in culturally important areas for future generations. How is this taken into account?

28. The paleoclimate records and James Hansen's work are not incorporated anywhere in the DEIS. The paleoclimate records are the best indications of understanding cause and effect with GHG emissions and warming.

29. Given that significant impairment and degradation and loss of life has already occurred as a result of human-caused climate disruption, how much more risk do the Lead Agencies estimate is tolerable or legally viable?

30. The atmospheric resource has already been substantially impaired. At what point did substantial impairment occur? When do carbon dioxide levels become unsafe?

31. How is consumption correlated to emissions? The Lead Agencies' decision should evaluate how completion of the proposed project would potentially enable other

projects to proceed and how these interdependent projects would increase consumption and thus increase emissions.

32. How has the 2014 National Climate Assessment, or any other recent state of federal climate change reports and studies been incorporated to enable a decision that allows for timely mitigation to climate change? It does not appear that the Lead Agencies have taken this information into account in its environmental analysis.

The DEIS Fails to Address the State of Washington's Constitutional and Public Trust Obligation to its Citizens to Protect Public Trust Resources, Including Water, Shorelines, Wildlife, Air/Atmosphere, and Oceans.

33. Pursuant to Washington's Constitution and public trust doctrine, and court order, Lead Agencies have "a constitutional obligation to protect the public's interest in natural resources held in trust for the common benefit of the people of the State" and a "responsibility to protect fundamental and inalienable rights protected by the Washington State Constitution." To fulfill these obligations, Lead Agencies must take actions to reduce carbon emissions within the State pursuant to the best science of climate recovery, as presented herein. In *Foster v. Ecology*, the court found:

> The scientific evidence is clear that the current rates of reduction mandated by Washington law cannot achieve the GHG reductions necessary to protect our environment and to ensure the survival of an environment in which Petitioners can grow to adulthood safely. In fact, in its 2014 report to the legislature the Department stated, "Washington's existing statutory limits should be adjusted to better reflect the current science. The limits need to be more aggressive in order for Washington to do its part to address climate risks."[18]

34. This proposed project would emit a tremendous amount of greenhouse gases (GHGs) (37.6 million metric tons of CO_2e over 20 years) if approved. Lead Agencies must evaluate how approval of this project would adversely impact the State's sovereign obligations to its citizens to protect their public trust res, for present and future generations.

[18] *Foster v. Wash. Dep't of Ecology*, No. 14-2-25295-1 SEA, 5 (Wash. Super. Ct. Nov. 19, 2015), *available at* http://ourchildrenstrust.org/sites/default/files/15.11.19.Order_FosterV.Ecology.pdf.

The DEIS Fails to Disclose any Conflicts of Interest, State Subsidies or Other Ways in Which Lead Agencies' Duty of Loyalty to Washingtonians is Compromised in the Decision-making Around This Project

35. The Lead Agencies owe a duty of loyalty to the Washingtonians and future generations in making decisions of this magnitude. The Lead Agencies owe no duty of loyalty to corporations or other countries when evaluating this project. How have the Lead Agencies exercised its duty of loyalty to the public and posterity?

36. Has, or will, the Project Proponent receive any state funding, tax breaks, or other forms of subsidy related to this project?

37. Has the DEIS been prepared with the assistance of a contractor or consulting firm? If so, has the contractor executed a disclosure statement specifying that they have no financial or other interest in the outcome of the project?

38. Has there been any conflict of interest that would jeopardize the objectivity and integrity of the Lead Agencies or any cooperating agency's environmental review of the proposed project?

39. Does any employee or contractor of the Lead Agencies or any cooperating agency involved in the environmental review of the proposed project have any financial or other interest in the outcome of the decision on whether to approve the proposed project?

40. Do any of the decision-makers have affiliations with fossil fuel industries? Have they worked for the fossil fuel industry in the past? Please disclose all ties that the Lead Agencies staff working on this project have to fossil fuel industries.

41. What type of lobbying has the fossil fuel industry done to the Lead Agencies regarding this project?

42. What will this project cost Washingtonian taxpayers in the form of direct and indirect subsidies and tax breaks?

43. Please disclose all communications that the Lead Agencies have had with the fossil fuel companies that would benefit from the project.

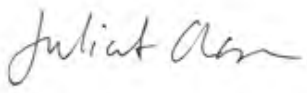
As confirmed by the 2014 reports from the National Climate Assessment and the Intergovernmental Panel on Climate Change, the climate changes that are currently occurring are unprecedented. The Lead Agencies and all of the agencies involved in the environmental review process of the proposed project must accept their constitutional public trust responsibility to protect the atmosphere and take the immediate bold action

necessary to prevent catastrophic climate change before it's too late.

Our Children's Trust submits this letter also on behalf of the TRUST Campaign and its partners, Earth Guardians, Youth Climate Action Now, WITNESS, 350 Eugene, Plant for the Planet, and on behalf of the young citizens of Washington. We also submit these comments as a Guardian for future generations of Washingtonians.

Thank you for your consideration. Please send us a response to our comments and the final EIS at the address listed below, on behalf of all of the commenters listed above.

Sincerely,



Julia Olson
Executive Director
Our Children's Trust
P.O. Box 5181
Eugene, OR 97405
Julia@ourchildrenstrust.org

PNWA
PACIFIC NORTHWEST WATERWAYS ASSOCIATION

June 8, 2016

Millennium Bulk Terminals EIS
Attention: ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Draft EIS for Millennium Bulk Terminals-Longview

Thank you for the opportunity to comment on the Millennium Bulk Terminal Draft EIS. I am submitting this letter on behalf of the Pacific Northwest Waterways Association (PNWA). PNWA is a non-profit trade association that advocates for federal policies and funding in support of regional economic development. We represent over 130 public and private sector member organizations in Oregon, Washington, and Idaho. Members include public ports, navigation, transportation, trade, tourism, agriculture, forest products, energy and local government interests. Since our founding in 1934, PNWA led the way for development of economic infrastructure for navigation, electric power and irrigated agriculture on the Columbia Snake River System. In 1971, we expanded, adding Oregon and Washington coastal port members to provide a comprehensive regional perspective. Today, PNWA works with the U.S. Congress, federal agencies and regional decision leaders on transportation, trade, energy and environmental policies and projects to enhance economic vitality in the Pacific Northwest. A full list of our membership is attached to this letter.

In fall 2010, the Columbia River navigation channel deepening project was completed, bringing the federal channel depth from 40 to 43 feet. The channel deepening authorization included extensive analysis by the U.S. Army Corps of Engineers and was undertaken to prepare the river for larger vessels with the goal of attracting new projects, increasing cargo movement out of our region and reducing transportation costs. Channel deepening has already resulted in over $1 billion dollars of public and private investment in the scant six years since it was completed.

The Columbia Snake River System is a 470 mile transportation link from the Pacific Ocean to Idaho. It is the nation's number one wheat export gateway and number two for soy. It is also the number one West Coast gateway for wood and mineral bulk products. Over $24 billion of cargo moved on the Lower Columbia in 2012, directly supporting over 40,000 local jobs, and we are poised to handle more cargo than ever before.

PNWA is supportive of thorough and fair reviews of all new projects on the river system, and we are concerned about the study's expanded scope. The study's inclusion of recommendations for mitigation of greenhouse gas emissions occurring outside of Washington State sets a concerning precedent for future development. The out of state emissions are not caused by the operation of the terminal, and are not within the Project's control. Should this criteria be included in other project permitting decisions, the resulting mitigation requirements will make the State of Washington uncompetitive with other port systems and threaten commodity movements and investment across the region. We suggest that the study area be limited to the State of Washington as has historically been the case for similar marine terminal developments.

www.pnwa.net

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As a major bulk export gateway, the Columbia Snake River System exports a wide variety of cargos and serves as a major international trade gateway for our nation. Cargo from the heartland of our country is routinely moved by rail or barge to the lower Columbia River for export. Navigation interests along the river system are committed to increasing these exports, ultimately bringing jobs, tax revenue and economic development to the region. Vastly expanding the regulatory scope creates uncertainty for future projects and undermines the efficiencies of the river system and the global competitiveness of our region.

Finally, PNWA is concerned at the length of review and permit processing time. The increased cost and uncertainty of permitting projects is becoming an increasingly severe burden on businesses and raises the cost of investing in the region and the river system. We respectfully request that the review and finalization process for the EIS is expedited to minimize the elapsed time between submission of permit applications and the issuance of a completed EIS.

Thank you for the opportunity to provide comment.

Sincerely,

Kristin Meira

Kristin Meira
Executive Director
Pacific Northwest Waterways Association

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PNWA Membership Roster

PNWA
PACIFIC NORTHWEST WATERWAYS ASSOCIATION

Advanced American Construction
Almota Elevator Company
American Waterways Operators
Apollo Mechanical Contractors
Barney & Worth
Bell Buoy Crab Co.
Bellingham Cold Storage
BergerABAM Engineers, Inc.
Bergerson Construction, Inc.
BNSF Railway Company
BST Associates
Business Oregon Infrastructure Finance Authority
Central Oregon Basalt Products
Central Washington Grain Growers
Clark Public Utilities
Clearwater Paper Corporation
Collins Engineers Inc.
Columbia Basin Development League
Columbia County Grain Growers
Columbia Grain
Columbia River Bar Pilots
Columbia River Pilots
Columbia River Port Engineers
Columbia River Steamship Operators Association
Columbia River Towboat Association
Cooperative Agricultural Producers
Dawson & Associates
David Evans and Associates
Dunlap Towing
East Columbia Basin Irrigation District
Ecological Land Services
EGT, LLC
Evergreen Engineering
Foss Maritime Company
Foster Pepper
Franklin PUD
Gibbs & Olson, Inc.
Global Partners LP
Gordon Thomas Honeywell
Great Lakes Dredge & Dock
Hart Crowser, Inc.
Idaho Wheat Commission
ILWU Oregon Area District Council
ILWU Puget Sound District Council
Jessie's Ilwaco Fish Co.
J-U-B Engineers, Inc.
Kalama Export Company
Kiewit Infrastructure West Co.
KPFF Consulting Engineers
Lampson International, LLC
Landau Associates
Lewis-Clark Terminal Association
Louis Dreyfus Commodities
Marine Industrial Construction
McGregor Company
Millennium Bulk Terminals
Moffatt & Nichol
Morrow County Grain Growers
Morrow Pacific Project
Normandeau Associates, Inc.
Northwest Grain Growers, Inc.
Northwest Public Power Assoc.
OBEC Consulting Engineers
OR Public Ports Association
OR Wheat Growers League
Pacific Northwest Farmers Co-op
Pacific Northwest International Trade Association
Parsons Brinckerhoff
PBS Engineering & Environmental
PND Engineers, Inc.
PNGC Power
Pomeroy Grain Growers
Port of Anacortes
Port of Astoria
Port of Bandon
Port of Bellingham
Port of Benton
Port of Camas-Washougal
Port of Cascade Locks
Port of Chelan County
Port of Chinook
Port of Clarkston
Port of Columbia County
Port of Coos Bay
Port of Everett
Port of Garibaldi
Port of Gold Beach
Port of Grays Harbor
Port of Hood River
Port of Ilwaco
Port of Kalama
Port of Klickitat
Port of Lewiston
Port of Longview
Port of Morrow
Port of Newport
Port of Pasco
Port of Peninsula
Port of Port Angeles
Port of Portland
Port of Ridgefield
Port of Royal Slope
Port of Seattle
Port of Siuslaw
Port of Skagit
Port of St. Helens
Port of Sunnyside
Port of Tacoma
Port of Toledo
Port of Umatilla
Port of Umpqua
Port of Vancouver
Port of Walla Walla
Port of Whitman County
Port of Woodland
PROCESS, Inc.
Puget Sound Pilots
RSEC Environmental & Engineering Consulting, Inc.
Schwabe, Williamson & Wyatt
Scoular Company
SDS Tug & Barge
Shaver Transportation Company
Stoel Rives LLP
Summit Strategies
Teevin Bros.
TEMCO
Tidewater
United Grain Corporation
USA Dry Pea & Lentil Council, Inc.
Vancouver Energy
Van Ness Feldman
WA Association of Wheat Growers
WA Council on International Trade
WA Grain Commission
WA Public Ports Association
WA State Potato Commission
Westwood Shipping Lines
Whole Brain Creative
Wildlands, Inc.
Willamette Falls Locks Working Group

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Submission Number: ***TRANS-SPOKANE-M2-00055***

Received: 5/26/2016 12:00:00 AM
Commenter: Colin Hastings
Organization: Pasco Chamber of Commerce
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good evening. My name is Colin Hastings. I'm here representing the Pasco Chamber of Commerce. We're looking forward to your hearing in Pasco next week. As part of our role as Pasco Chamber I'm supposed to make sure that the weather is going to be cooperative so you can enjoy the nice sunshine there.

But on the serious note, recently our board of directors passed a resolution in support of the Millennium Bulk Terminal and the BNSF for their efforts in making sure that we keep jobs here in Washington state.

Pasco was built on transportation. Rail, air, and through the waterways, too. And it's very important to our economy. And we realize this as well, too, with this project, too, how important it is to our economy in Washington state's economy.

Pasco Chamber, as also known, is the local agriculture too. The economy in Franklin County is primarily agriculture driven. They depend on a safe, secure way of transporting their goods to market. I mean, almost all the vendors around Franklin County is out for export. And so having the transportation infrastructure is vastly important to that.

And on top of that, the expanded program EIS on greenhouse gases I think oversteps the bounds of what the Department of Ecology has done. It sets a very dangerous precedent and could have ramifications not only on this industry but other manufacturing industries in Washington state as well as agriculture, too.

So I'm here to raise some support for Millennium Bulk Terminal. Thank you.

Submission Number: ***MBTL-SEPA-DEIS-0001477***

Received: 5/31/2016 10:51:33 AM
Commenter: David Taylor
Organization: Pennsylvania Manufacturers' Association
State: Pennsylvania

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

On behalf of the 565,000 Pennsylvanians who work in manufacturing, I am writing to voice my support for the proposed export facility in Longview that is currently undergoing environmental review. I am pleased that the Washington Department of Ecology and Cowlitz County concluded that the project area would experience no significant adverse environmental impacts from the port expansion. I am, however, deeply concerned that the draft environmental report recommends that the owners of the terminal mitigate the greenhouse gas (GHG) emissions not only of the project itself but the goods being shipped through the terminal. This is dangerous precedent for manufacturers who export their products, all of which contain an environmental footprint. Federal and state environmental permitting laws all consistently set the scope of an infrastructure review to local environmental impacts. By forcing the terminal operators to account not only for the local environmental impacts of the port expansion but also the global environmental footprint of the cargo, the Department of Ecology and Cowlitz County are creating a dangerous precedent that could be used to impede exports of all products, not just in Washington but from ports across the country. That is a bad policy for manufacturers, who rely heavily on exports to compete in a global economy. Thank you for the opportunity to comment. I urge the agencies to issue final permits for this project as quickly as possible and remove language related to the mitigation of emissions from goods being shipped through the terminal.

Submission Number: ***TRANS-LV-Q1-00059***

Received: 5/24/2016 12:00:00 AM
Commenter: Ally Shapiro, Deanna Richardson, Susan Haywood
Organization: Portland Raging Grannies
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

We're part of the Portland Raging Grannies. My name is Ally Shapiro, Deanna Richardson, Susan Haywood, and we would like to sing for you our testimony. This is called Leave it in the Ground. Coal, oil, gas, none of these shall pass. Leave it in the ground and turn the trains around. Cascadia is a place of great power. We stand at the mouth of the river rooted to the land and its people, we turn the trains around. Coal, oil, and gas, none of these shall pass. Leave it in the ground and turn the trains around. We are a people awakening, we are a people reclaiming, we are a people demanding, turn the trains around. Coal, oil, gas, none of these shall pass. Leave it in the ground and turn the trains around. Turn the trains around.

SELA
SAFE ENERGY
LEADERSHIP ALLIANCE

June 8, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave., Suite 550
Seattle, WA 98104

Elaine Placido
Director,
Cowlitz County Building and Planning
207 4th Ave. N
Kelso, WA 98626

Diane Butorac
Regional Planner
Washington Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

Danette L. Guy
Biologist/Project Manager,
U.S. Army Corps of Engineers
Regulatory Branch
c/o MBTL EIS
710 Second Ave., Suite 550
Seattle, WA 98104

Dear Ms. Butorac, Ms. Placido, and Ms. Guy:

Thank you for the opportunity to comment on the Draft Environmental Impact Statements (DEIS) for the proposed expansion of the Millennium Bulk Coal Terminal in Longview, Washington, which is projected to handle up to 44 million metric tons of coal a year with 24/7 operations for 30 years.

The terminal would generate up to 16 trips by loaded and unloaded, mile-and-a-half long trains along rail corridors in Washington, Oregon, Idaho, Montana, and Wyoming each day, and an estimated 1,680 transits of Panamax bulk vessels on the Columbia River.

We are members of the Safe Energy Leadership Alliance or SELA**,** a coalition of more than 165 elected local, Tribal, and state leaders from Pacific Northwest and British Columbia advocating for full assessment of risks and costs for significant expansion in coal and oil export. While we come from diverse communities, both rural and urban, we share core interests of protecting public health and safety, economic development, Treaty rights and cultural resources, and the environment in our communities.

Impacts from the proposal terminal will be carried across state lines along river and corridors. Increased rail and barge traffic will have direct and cumulative impacts on safety, traffic, noise, air and water pollution, and economic development not only in the immediate vicinity of the terminal in Longview, but also communities in four states.

Our specific concerns about the DEIS include the following:

- **The geographic scope of analysis for many of the DEIS elements is too narrow to capture impacts to impacted communities and resources along rail and barge routes.** For example, the analysis and mitigation of noise and economic impacts is focused only on Kelso, Longview, and Cowlitz County despite the fact noise and traffic impacts along rail and barge lines will impact communities in five states. Further, the DEIS acknowledged disproportionate impacts to Minority and Low-Income Populations within 1 mile of the project area and 0.5 mile of the affected rail lines in Cowlitz County. Again this, underrepresents the full scope of the impact, which extend to communities beyond the borders of Cowlitz County.

  Impacts to protected areas along rail and barge lines are a particular concern. The Columbia River Gorge National Scenic Area is just one of many protected and sensitive areas that would be negatively impacted by coal trains that would service this facility. Wetlands, wildlife refuges, state parks, tribal fishing areas, critical fish, wildlife and plant habitat, recreation, and scenic resources would be harmed by the impacts of this facility, its trains, and the expansion of rail lines needed to accommodate the increase in rail traffic.

- **The DEIS notes that without improvements to rail infrastructure to expand capacity, the Proposed Action could result in significant impacts on rail and vehicle transportation. However, no investments in infrastructure improvements are proposed as mitigation outside the local project area.** Instead, proposed mitigations along rail main lines are focused on coordination and notification, shifting the burden for costly infrastructure improvements for crossing safety and traffic to communities like ours.

- **The DEIS downplays impacts from coal dust on public health and environment, and does not reflect the impacts communities along rail lines are already experiencing.** Every loaded train that would deliver coal to this facility would pass through the Columbia River Gorge National Scenic Area in uncovered cars. Communities along the Gorge already report issues with deposits of coal dust along rail lines from existing goal trains, where contaminants can be washed in to the river. The DEIS projects that "average and maximum deposition of coal dust on the BNSF main line in Cowlitz County [is] estimated to be above the nuisance thresholds at 50 and 100 feet," but then finds that these impacts are "not significant" because no state or federal standards apply. While application of surfactant is a proposed mitigation, this treatment only reduces but does not eliminate coal dust coming off of open coal cars. The proposed requirement to establish a coal dust complaint system only applies in Cowlitz County, and the requirement to share information with the Columbia River Gorge Commission once a year does not address the physical impacts of coal dust or provide any certainty they will be addressed.

- **The DEIS acknowledges impacts to fish populations and to Tribal fishing access across rail lines, but fails to fully analyze or propose mitigation to avoid significant adverse impacts.** The DEIS notes that to mitigate impacts on access to tribal treaty fishing areas, the Applicant may initiate a process with Columbia River Inter-Tribal Fish Commission officials to discuss and identify mitigation measures prior to beginning operations. This does not provide certainty that impacts to fishing access will be avoided or mitigated.

- **The analysis of economic impacts is focused on the local project area and Cowlitz County, and this does not fully capture the regional economic impacts of increased traffic congestion, over-capacity rail lines, air and water pollution, and noise along rail lines and the Columbia River.** Farmers are already experiencing difficulties in getting commodities to market. Within communities along the rail line, traffic congestion, pollution, and noise will deter economic development.

The DEIS fails to provide a full and accurate assessment of direct and indirect impacts on traffic, public safety, air and water quality, protected areas, fishing access, and economic development across the region impacted by related rail and barge traffic. Even with these shortcomings, the DEIS still identifies several significant adverse impacts extending far beyond the local project area with uncertain mitigation. Many of the proposed mitigations fall into the category of monitoring or coordination, raising the concern that the burden of costs for physical mitigation will fall to local communities along rail and barge lines. From the perspective of regional economic development, the proposed project represents a risky investment in a declining commodity with significant impacts to our health and environment. The final EIS must provide a more robust analysis of full costs and risks of this proposal to communities across the impacted region.

Thank you for considering our comments.

Sincerely,

Lisa M. Batey

Jessica Bateman
Councilmember, City of Olympia WA

Lisa Batey
Councilmember, City of Milwaukie, OR

Paul Blackburn

Paul Blackburn
Mayor, City of Hood River, OR

Jack Burkman

Jack Burkman
Councilmember, City of Vancouver, WA

Arlene Burns
Mayor, City of Mosier, OR

Joan Cathey
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Washington State Senator (22nd LD)

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Washington State Representative (43rd LD)

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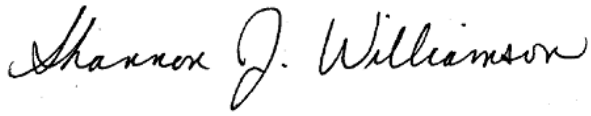

Alishia Topper
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Shannon Williamson
Council President, City of Sand Point, WA

cc:
The Honorable Jay Inslee, Governor, State of Washington
The Honorable Patty Murray, United States Senate
The Honorable Maria Cantwell, United States Senate
The Honorable Jamie Herrera Beutler, United States House of Representatives

Submission Number: ***TRANS-PASCO-M1-00080***

Received: 6/3/2016 12:00:00 AM
Commenter: Margie Van Clef
Organization: Sierra Club
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hello. My name is Margie Van Clef (phonetic). I leave in Selah. I'm giving testimony as I chair over 24,000 members of Sierra Club in Washington state. Many interests of Yakima Valley has already recognized the threat of climate change.

The Yakima River Basin Water Enhancing Project working group was created to represent tribal, agriculture, environmental (inaudible) of the Yakima Basin including the Kennewick Irrigation District and Benton County. One of the documents from the work group was an environmental impact statement of the Yakima River Basin Integrated Water Resource Management Plan dated 2012.

Page II states climate change protections indicate that there will be changes in runoff stream flow patterns, which would increase the need for reduced flows for fish. These changes include the decreased snow pack, increased frequency of drought conditions, increase impacts of fish, increased flows, increased water temperatures.

So why are we talking about transporting coal to increase climate change while burned in Asia and while at the same time asking for billions of tax dollars due to the increased change in climate change? You can't have it both ways.

If we want to keep the agriculture base in Yakima Valley, don't transport the coal. Work to keep our snow pack. Many coal trains a day will make our apples go away. Burning coal is harmful to our health and safety, and water quality. These impacts should be studied in the EIS. The risks are far too great.

Thank you.

Sightline Institute Comments on the Draft Environmental Impact Statement for Millennium Bulk Terminals-Longview

Prepared by Clark Williams-Derry, Director of Energy Finance
June 13, 2016

Sightline Institute is a think tank that provides original analysis of energy, economic, and environmental policy in the Pacific Northwest. Sightline submits these comments on the Millennium Bulk Terminals-Longview Draft Environmental Impact Statement (MBTL-DEIS, or simply DEIS) in hopes both of improving the final Environmental Impact Statement and of informing the broader debate about coal export proposals in from the US west coast. Our comments focus on two technical reports prepared under the State Environmental Policy Act (SEPA): the SEPA Greenhouse Gas Emissions Technical Report (GHG-TR), and the SEPA Coal Market Assessment Technical Report (CMA-TR).

Sightline's comments are divided into three themes: **appreciation** for valuable contributions of the MBTL-DEIS, particularly in comparison with previous analyses of coal market dynamics; **significant implications** of the DEIS findings; and substantive **critiques** of the MBTL-DEIS.

APPRECIATION

Many of our comments offer critiques of the DEIS—including its data sources, methods, assumptions, and lack of transparency. Still, there is much to praise in the DEIS, particularly compared with comparable impact statements from other coal projects in recent years. Below, we cite three major areas in which the MBTL-DEIS improves on prior analyses of coal export market dynamics.

1. **The MBTL-DEIS correctly recognizes that coal exports aren't financially viable in today's seaborne coal market.**

The GHG-TR states on p. 3-9, section 3.1.3.2:

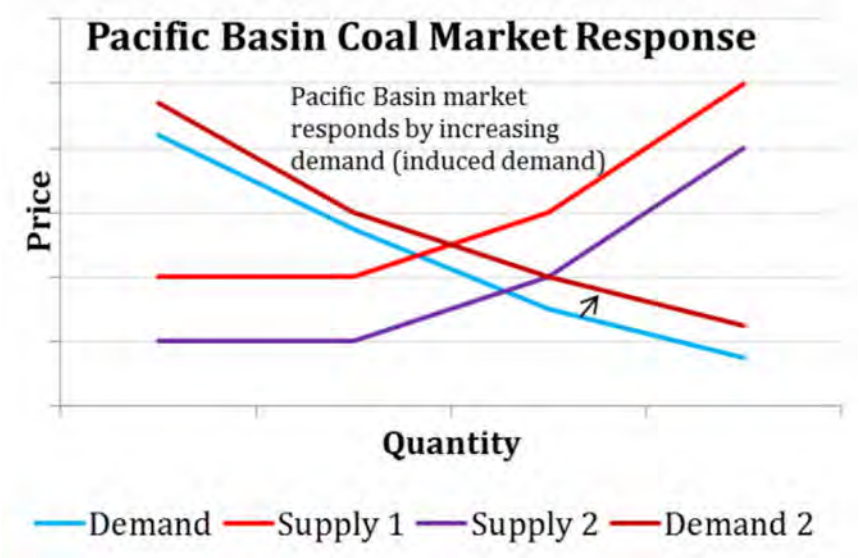
> Delivered prices to Japan…suggest that ***Powder River Basin coal would have a difficult time being cost-competitive, if shipped through the Pacific Northwest to Japan or other Pacific Basin countries, until international coal prices increase.*** [Emphasis added.]

The DEIS correctly recognizes that Powder River Basin (PRB) coal exports simply can't compete at today's low seaborne coal prices. This is corroborated by the fact that PRB coal exporter Cloud Peak Energy announced last fall that it would halt all coal exports for 3 years, citing accelerating losses from selling coal into an oversupplied Pacific Rim market. Coal producers from outside the PRB face similar struggles: Signal Peak Energy and Bowie Resource Partners have also curtailed exports in the face of weak coal prices and chronic oversupply in export markets. And since futures markets currently foresee modest increases in Pacific Rim coal prices through 2022, there is little reason to believe that the economics of coal exports will improve any time soon. The authors of the report should be commended

for a remarkably candid admission that the MBTL project will be financially unviable unless the now-deflated Pacific Rim coal bubble were to re-inflate.

2. The MBTL-DEIS correctly acknowledges that increasing coal exports would boost Asian coal consumption.

Charts on p. 3-15 of the GHG-TR, along with accompanying discussion in the text, accurately describe the market dynamics by which increased US coal exports could stimulate additional demand in Pacific Basin coal markets. One of these charts is shown below:



The MBTL-DEIS acknowledges that a significant increase in coal exports from the US west coast would lower seaborne coal prices in the Pacific Rim, thereby boosting coal consumption in Asia. The magnitude of the increase is subject to debate. But the basic market dynamics are find support both in economic theory and in the historical experience on seaborne coal markets.

This accurate portrayal of market dynamics stands in stark contrast to previous analyses of coal exports. For example, the DEIS for the proposed Tongue River Railroad in Montana (TRR-DEIS) essentially assumed that Asian energy consumption patterns are fixed, and that Asian coal consumers do not respond to prices. The analysis then "concluded" that coal exports would have no effect on Asian coal demand—though that "conclusion" appeared to be nothing more than a consequence of the false assumption about the inelasticity of Asian coal demand. With these errors, the Tongue River Railroad DEIS ignored basic economic theory, disregarded historical experience, and presented dubious and unfounded assumptions as if they were reliable conclusions. Even more shockingly, the TRR-DEIS explored market dynamics in US coal markets in depth, while essentially ignoring market dynamics in Asia.

To its credit, the MBTL-DEIS avoids these fundamental errors by recognizing that a significant boost in seaborne coal supplies would reduce Pacific Rim coal prices, and that low prices in turn would escalate coal demand in Asia.

3. The MBTL-DEIS acknowledges that increasing US coal exports would likely boost global greenhouse gas emissions.

After considering possible dynamics in both domestic and international markets, the MBTL-DEIS concludes that under most reasonable scenarios a significant increase in US coal exports would boost net global greenhouse gas emissions. This conclusion matches the reasonable, common-sense intuition that shipping tens of millions of tons of high-carbon fuels thousands of miles to the world's most energy-hungry economies would cause climate-warming emissions to rise.

However intuitively reasonable this conclusion may seem, it nonetheless conflicts with some previous analyses by the same consulting group that worked on the MBTL-DEIS. Commendably, these consultants have responded to methodological critiques of previous modeling efforts by considering possible market dynamics in Asia as well as the US—particularly the likely increase in Asian coal demand resulting from a significant increase in seaborne coal supplies.

SIGNIFICANT IMPLICATIONS

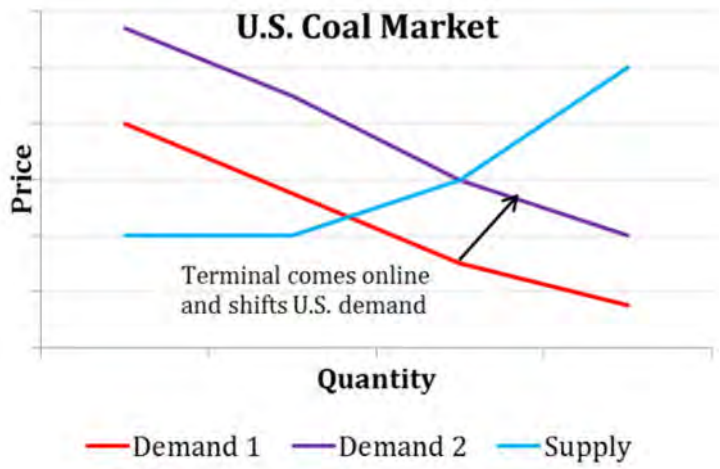
Below we note three important policy and economic implications of the MBTL-DEIS that both the public and policy makers would be wise to take note of.

1. Coal exports would boost domestic coal and power prices.

The discussion on page 3-14 of the GHG-TR clearly and correctly explain an important fact about the US coal industry's plans to expand coal export infrastructure: **boosting exports would raise domestic coal prices**.

> [T]o the extent that Asian coal prices are higher than U.S. coal prices, operation of the Proposed Action would cause Asian coal prices to decline, ***while U.S. coal prices would increase***. [Emphasis added.]

Charts on the same page, including the one below, demonstrate the same point.



Page 3-8 of the GHG-TR expresses the pricing dynamics clearly:

> "Domestic coal prices increase in every scenario in response to the export of Powder River Basin and Uinta Basin coal."

And since the US coal industry sells primarily to electric utilities, higher coal costs generally will be passed on to consumers as higher prices for electricity.

The fact that US coal exports would raise domestic energy prices rarely receives much attention in public debates about coal exports. But it did not escape Wall Street's notice. Several financial analysts have pointed out that coal exports could boost coal company revenue not only by giving US coal companies access to more lucrative overseas markets, but also by raising coal prices on domestic markets. In the unlikely event that Asian coal markets rebounded enough to justify robust US coal exports, the "one-two punch" of higher revenues on export markets and higher prices on domestic markets would substantially boost the fortunes of US coal companies at the expense of US energy consumers.

2. The "Upper Bound" scenario—which has the highest greenhouse gas impacts of any single-terminal scenario considered—is also the only scenario in which coal exports are economically viable.

As discussed above, the MBTL-DEIS admits that coal exports are not economically viable at today's prices. In fact, Cloud Peak Energy, the best positioned Powder River Basin coal exporter, last reported a profit from export sales in the first half of 2013. At that time Asian coal demand was robust and growing, and benchmark Newcastle, Australia coal prices were above $85 per ton. In 2014 Cloud Peak Energy executives stated in an investor conference call that coal prices would have to rise to the $80-90 per ton range for the company to break even on exports.[1] In all likelihood, prices would have to rise even higher

[1] Seeking Alpha, "Cloud Peak Energy's CEO Discusses Q1 2014 Results - Earnings Call Transcript," April 30, 2014, http://seekingalpha.com/article/2175763-cloud-peak-energys-ceo-discusses-q1-2014-results-earnings-call-transcript?part=single

for private capital markets to lend coal port developers the money needed to construct and operate a massive coal export terminal.

Of the four single-terminal scenarios considered in the MBTL-DEIS, the "Upper Bound" scenario is the only one that assumes that international prices would be high enough for economically viable PRB coal exports from the western US. As described in Table 23 of the CMA-TR, the "Past Conditions" and "2015 Energy Policy" scenarios assume that benchmark Pacific Rim coal prices would remain between $60 and $70 per ton—which is too low for even the best positioned PRB coal companies to profit from exports. The "Lower Bound" scenario puts international prices even lower, at $54 to $63 per ton. In contrast, the Upper Bound assumes international prices of at least $90 per ton, which is high enough for Asian exports to turn a profit.

Clearly, a resurgence of west coast coal exports would require a sizable rebound in Asian coal prices and demand. Only the Upper Bound scenario assumes such a rebound in Asian prices and demand; the other 3 single-terminal scenarios assume international price levels far too low to support viable PRB coal exports. In turn, the Upper Bound scenario finds the greatest greenhouse gas impact from US export operations of any scenario considered, with a net increase of 442.7 million tons of greenhouse gas emission over 20 years.

Policymakers would be wise to take note that the only economically viable single-terminal scenario considered by the MBTL-DEIS is also the scenario in which construction of MBTL would lead to particularly large increases in greenhouse gas emissions.

3. Despite the permit denial for the Gateway Pacific project, the Cumulative Scenario may still be relevant.

The MBTL-DEIS lays out a "Cumulative Scenario" that looks at the market dynamics of a full build-out of proposed coal export infrastructure on the US west coast, including not only MBTL but also the proposed Gateway Pacific and Morrow Pacific export projects. The Cumulative scenario showed greenhouse gas impacts that far exceeded even the Upper Bound scenario for the MBTL terminal.

In early May 2016, however, the Army Corps of Engineers denied a key permit for the 48 million metric ton Gateway Pacific coal export terminal. On first blush, it may appear this denial has rendered the Cumulative scenario irrelevant. However, a resurgence of Asian coal demand—which appears highly unlikely but not inconceivable—could also make other coal export terminal proposals viable once again. After all, at the height of the Pacific Rim coal bubble, coal and port companies had proposed three additional coal export terminals with a combined capacity of up to 46 million metric tons. A robust resurgence in international prices could spur similar proposals in the future.

In short, even with Gateway Pacific now out of the picture, the Cumulative Scenario may still offer a useful reference point for gauging the potentially enormous greenhouse gas impact of a full build-out of coal export infrastructure on the North American coast.

CRITIQUES

Notwithstanding our appreciation for the constructive contributions of the MBTL-DEIS, Sightline Institute remains concerned about many of the key elements of the analysis.

1. The MBTL-DEIS relies on a closed, proprietary model with hidden assumptions and methods.

The MBTL-DEIS relies on a complex, propriety model of the US energy system developed by private consulting firm. While the MBTL-DEIS discloses certain inputs to the model, many of key input parameters, methods, and assumptions used in this model remain hidden from view. As a result, the model and its results are untestable, unverifiable and—most importantly—unfalsifiable. This makes it literally impossible to confirm, refute, or even effectively critique the analysis.

Sightline finds it inappropriate for government agencies to rely on closed, proprietary, "black box" models in processes that are designed to inform the public of the consequences of significant public policy decisions. The lack of model transparency clouds key issues, thwarts independent review, and may ultimately undermine public confidence in its results and conclusions.

2. International pricing conditions and market behavior assumed in most of the export scenarios contradict real-world experience and defy rational market behavior.

Table 23 of the CMA-TR describes the four single-terminal market scenarios analyzed in the MBTL-DEIS. Three of these scenarios assume that benchmark Newcastle, Australia coal prices would be at or below their 2014 range of $60-70 per ton. The model runs for these scenarios indicate that coal exports from the proposed MBTL project would total 44 million tons per year.

Simply put, the export results for these three scenarios are preposterous. Unless coal mining and shipping costs were to decline radically, there is simply no way that PRB coal can be profitably exported to Asia when prices are at or below $70 per ton.

Perhaps the best evidence of the absurdity of profitable PRB exports at Newcastle prices of $70 per ton comes from the financial filings of Cloud Peak Energy, widely acknowledged as the best-positioned coal exporter from the PRB. The company's Spring Creek mine has distinct advantages in export markets over competing PRB mines, including comparatively high energy content and short rail distance to existing and proposed ports on the west coast. As a result, Cloud Peak continued to export PRB coal long after rivals Arch Coal and Peabody Energy halted their own PRB exports.

Even with its advantages, though, Cloud Peak began losing money on exports in mid-2013, when Newcastle coal prices fell below $85. By its own admissions, the company only continued to ship coal after mid-2013 because it faced stiff penalties under long-term shipping contracts signed near the peak of the Pacific Rim coal bubble.

Precise export breakeven points for Spring Creek depend on a variety of other factors besides Newcastle prices, including fuel, mining, and shipping costs. Nonetheless, when asked in mid-2014 the price at

which the company could break even on exports, Cloud Peak's CEO stated: "it's between $80 and $90 I think and maybe $85 is as good a number as any."[2]

Since then, however, Cloud Peak's production and transportation costs have declined for a trio of interrelated reasons, all stemming from sharp declines in global energy prices. First, bulk carrier rental costs collapsed as the Pacific Rim coal price bubble deflated and demand for bulk cargo ships waned. Second, falling oil prices reduced the cost of fuel used for mining equipment, rail transportation, and international shipping. Third, lower oil and gas costs led to declines in other mining inputs, such as explosives. Yet even with these tremendous cost reductions, Cloud Peak's CEO recently estimated that Australian benchmark coal prices still must reach at least $75 for the company to break even on exports.[3]

Cloud Peak is in the best economic position of all PRB coal exporters, and its Spring Creek mine can produce no more than 20 million tons per year even under the best market conditions.[4] So it simply strains credulity to think that PRB exporters could profitably ship 44 million tons of coal per year to Asia when benchmark coal prices remain at $70 per ton or below.

Despite the financial absurdity presented in these three scenarios, the CMA-TR makes only one brief nod to the financial difficulties that coal exporters would face from the low international prices foreseen in these export scenarios. Section 6.3.2 states that the "lower international coal prices" assumed in the Lower Bound scenario "would be a challenging market environment for coal transported through the terminal." In the context, "challenging" is an understatement. "Impossible" would be more accurate; and the challenges would be felt not only in the Lower Bound scenario, but also the Past Conditions and Energy Policy 2015 scenarios as well.

Because the MBTL-DEIS relies on a closed, proprietary, "black-box" model, there is simply no way to determine the reasons for the model's failure. Perhaps the model simply assumes that PRB coal companies could profitably export coal when international benchmark coal prices remain below $70 per ton. Perhaps the model is broken, and calculated that PRB coal could price into international markets at those low prices. Perhaps the model presumes that US exporters would be willing to export at a significant loss, or that Asian importers would be willing to pay a steep premium for US coal. Since this model failure currently remains a mystery, there is no way to tell if the specific reasons for the model's erroneous results would affect potential market dynamics in Asia.

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[2] Seeking Alpha, "Cloud Peak Energy's CEO Discusses Q1 2014 Results - Earnings Call Transcript," April 30, 2014, http://seekingalpha.com/article/2175763-cloud-peak-energys-ceo-discusses-q1-2014-results-earnings-call-transcript?part=single.

[3] Seeking Alpha, "Cloud Peak Energy's (CLD) CEO Colin Marshall on Q2 2015 Results - Earnings Call Transcript," July 29, 2015, http://seekingalpha.com/article/3372415-cloud-peak-energys-cld-ceo-colin-marshall-on-q2-2015-results-earnings-call-transcript?part=single.

[4] John T. Boyd Company, "Powder River Basin Coal Resource and Cost Study," September 2011, https://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory%20PDFs/PSCo-ERP-2011/8-Roberts-Exhibit-No-MWR-1.pdf.

Regardless of the explanation, the MBTL-DEIS model's failure to match economic reality raises deeply troubling possibilities. At best, the model's failure suggests that the entire modeling exercise is deeply flawed. At worst, it suggests that the modeling exercise was intentionally designed to put the economic viability of the terminal in the most favorable possible light. Either way, the findings raise troubling questions about the utility and reliability of the entire MBTL-DEIS modeling exercise, particularly for the scenarios in which international coal prices remain below $70 per ton.

3. The MBTL-DEIS presents puzzling assumptions and findings that are at odds with known market dynamics.

Here are three examples of assumptions and/or findings in the MBTL-DEIS that raise troubling questions about the extent to which the analysis is grounded in reality"

- **The MBTL-DEIS finds that all coal exported from MBTL would be shipped to Japan**. Tables 33, 49, and 81—which present the modeled flows of US coal to Asian markets under the Lower Bound, Past Conditions, and Energy Policy 2015 scenarios—find that all coal 44 million tons of coal exported via MBTL would be purchased by customers in Japan. The text accompanying the tables explains that Japan is the destination for all US coal because it is "the closest destination and thus would allow for the greatest reduction in system costs when the model calculates a solution."

  However, Japan is *already* the closest destination for PRB exports. Yet in both 2013 and 2014 more PRB coal was shipped to South Korea than to Japan.[5] This was because power plants are designed and tuned to burn higher calorie coal from Australia, rather than the lower-calorie coal sub-bituminous coal produced in Indonesia and the PRB. As a result, Japan has imported roughly three times as much coal from Australia as from Indonesia, despite the latter country's proximity advantage.[6] The reverse is true in South Korea, which has many power plants designed to burn sub-bituminous coal; and PRB coal is a good substitute for many grades of Indonesian sub-bituminous thermal coal most commonly consumed in South Korea. At present, then, South Korea is a more fitting destination than Japan for PRB exports.

  The fact that the MBTL-DEIS model finds that PRB coal would find eager buyers in Japan but no buyers whatsoever in South Korea, based solely on shipping distance, suggests that the MBTL-DEIS model lacks the detail, specificity, and real-world market information needed to analyze US coal exports with accuracy.

- **China's coal consumption has declined swiftly, but the MBTL-DEIS scenarios all assume that China's coal appetite will continue to grow**. Chinese coal consumption fell by 2.9 percent in 2014 and 3.7 percent in 2015. Astonishingly, early data suggests that consumption has fallen by

[5] See Westshore Terminals annual reports, http://www.westshore.com/#/financereports.
[6] Hiroyuki Tsuruki, "Flows of Thermal Coal into Asia Ensuring Stable Supplies for Japan," Mitsui & Co., Ltd., 2014, p. 9, http://www.jcoal.or.jp/coaldb/shiryo/material/upload/1-9Mitusi%20Mr.%20Tsurugi.pdf.

more than 8 percent in the initial months of 2016.[7] Even the International Energy Agency, which has been consistently bullish on coal consumption growth, has begun to speculate that Chinese coal consumption has already peaked.[8]

Nonetheless, all of the scenarios examined in the MBTL-DEIS assume that China's coal consumption will rise steadily through at least 2030. (See CMA-TR, Tables 14, 15, 16, 28, 44, 60, 76, and 92.) It is both troubling and confusing that the MBTL-DEIS did not see fit to include scenario that matches today's reality of rapidly declining coal demand in the world's most coal-hungry economy. Even more troublingly, Figure 12 in the CMA-TR portrays China's coal exports only through 2012, even though the Chinese customs agency had published coal import and export data through 2015 by mid-January 2016.[9]

- **The MBTL-DEIS appears to assume that domestic and export coal sales are completely fungible.** The MBTL-DEIS seems to assume that all coal that would be exported to Asia would otherwise be available for sale to domestic customers. Yet it's becoming increasingly clear that West Coast exports would draw from mines that may not be viable for domestic markets.

  As described above, Cloud Peak Energy's Spring Creek mine is currently the best positioned PRB mine for the export market. But Cloud Peak has admitted that there is only a limited US market for Spring Creek coal. When grilled in an investor conference call about why the company was continuing to export Spring Creek coal at a loss instead of selling the coal domestically, the company's CEO said: "there's a finite market for Spring Creek coal domestically. So we would not obviously be able to sell it." Spring Creek coal finds a limited domestic market in large part because its ash is high in sodium, which can corrode power plant boilers and impair generator performance.[10]

  Yet despite the difficulty that Spring Creek and other Northern PRB coals face in domestic markets, Cloud Peak Energy has been pursuing an expanded "export-oriented" mining complex centered on Spring Creek. This suggests that PRB coal companies may be adopting a two-pronged production strategy, targeting specific mines to the domestic market and other mines to export markets.

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[7] Sophie Yeo, "Analysis: Decline in China's coal consumption accelerates," *Carbon Brief,* February 29, 2016, http://www.carbonbrief.org/analysis-decline-in-chinas-coal-consumption-accelerates; Tim Buckley, "15.5% Drop in China Coal Production Shows Transition Gaining Speed," Institute for Energy Economics and Financial Analysis, June 13, 2016, http://ieefa.org/ieefa-note-15-5-drop-china-coal-production-shows-transition-gaining-speed/.
[8] Ambrose Evans-Pritchard, "International Energy Agency sees 'peak coal' as demand for fossil fuel crumbles in China," *The Telegraph,* December 19, 2015, http://www.telegraph.co.uk/finance/economics/12058456/IEA-sees-peak-coal-as-demand-crumbles-in-China.html.
[9] http://www.customs.gov.cn/tabid/49666/Default.aspx
[10] R. W. Borio and A. A. Levasseur, "Overview of Coal Ash Deposition in Boilers," Argonne National Laboratory, https://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/29_4_PHILADELPHIA_08-84_0193.pdf.

To the extent that markets for domestic and export coal do not overlap and are not fully fungible, boosting PRB exports may have more limited effects on domestic coal markets than the MBTL-DEIS finds—with exports doing less to increase domestic coal prices and prompting more modest reductions in domestic coal emissions.

4. The Final EIS should provide more information about its model's assumptions and methods.

As it currently stands, the MBTL-DEIS does not contain enough detail to allow for full independent analysis, review, and corroboration of the model's main conclusions. The final version should provide additional information on the model's assumptions, methods, and inputs, including:

- **Coal supply cost curves.** The MBTL DEIS does not specify—or even describe in general terms—coal supply cost curves in either the US or in Asia. This makes it impossible to gauge whether the model accurately represents the likely market dynamics resulting from changes in coal supply, demand, and prices.

- **Price benchmarks.** Table 23 describes pricing assumptions for "International Coal Prices" in different market scenarios. But it does not describe the specific international pricing benchmarks to which it refers. The benchmark matters enormously: prices vary widely depending on the grade of coal, the location of at which it is sold, and the basis in which it is quoted. Throughout our comments, Sightline has assumed that the MBTL-DEIS uses the Newcastle, Australia free-on-board 6,300 kcal/kg Gross-As-Received benchmark, which is the most commonly cited Pacific Rim coal pricing yardstick. But since the MBTL-DEIS does not specify what it means by "international coal prices," it is literally impossible for the public to understand or evaluate the precise pricing and market scenarios being discussed.

- **Economy-wide energy demand response.** The MBTL-DEIS clearly indicates that it considers domestic coal-to-natural gas switching when assessing the effects of coal prices on US electricity markets. However, there is no indication of whether the model explores how changes in US or Asian energy prices alter the *overall* demand for energy. As a result, it is difficult to discern whether the model finds that changes in coal prices affect total energy demand, of if the model simply "reshuffles the deckchairs" among different fuel sources while keeping aggregate demand fixed. And there is no indication of whether it uses different assumptions and methods about aggregate demand in the US vs. Asia.

- **Natural gas fuel switching and cross-elasticities in Asia.** Section 4.2.9 describes the methods used in the MBTL-DEIS to estimate own-price elasticities in Asian gas, coal, and electricity consumption. But there is no indication of how, or even whether, the MBTL-DEIS considered cross-elasticities among those commodities in Asia. As a result, it is not clear whether the DEIS considers potential ripple effects of lower coal prices in Asia, such as increased aggregate demand for electricity, or even decreased demand for natural gas. We are left to wonder, for example, whether gas-to-coal switching in Asian power production is an additional effect of

lower gas prices that the MBTL-DEIS does not account for, or if those effects are covered at least cursorily in the analysis.

CONCLUSION

Despite its methodological shortcomings and lack of transparency, the MBTL-DEIS makes some significant contributions to the literature on the effects of coal exports on greenhouse gas emissions—particularly by looking at the potential market effects of spurring additional coal consumption in Asia. Those effects are ably summarized in the fact sheet on greenhouse gas emissions that accompanies the MBTL-DEIS.[11]

> **Are there significant and adverse impacts that cannot be mitigated?**
>
> The mitigation measures identified above will substantially reduce, but not completely eliminate, the greenhouse gas emissions attributable to the proposed project. ***The proposed project's remaining projected contribution to greenhouse gas emission impacts, which are cumulative in nature, would still be significant and adverse.*** [Emphasis added.]

This is perhaps the most important single finding of the DEIS: that, all else being equal, and after considering both domestic and international market dynamics, a coal export project that could ship 44 million tons of coal per year to the globe's most energy-hungry markets would significantly boost net global greenhouse gas emissions. In the Upper Bound scenario GHG emissions over 20 years could reach as high as 443 million metric tons—nearly five times the annual emissions from all sources in Washington State in 2012.[12] Given these startling figures, Washington policy makers would be wise to take the DEIS as a blaring warning signal that approving the MBTL project could do far more to harm the climate than any other project in the state's history.

[11] Washington State Department of Ecology, "Millennium Bulk Terminals—Longview: Greenhouse Gas Emissions Fact Sheet," http://www.millenniumbulkeiswa.gov/assets/15.-ghg-fact-sheet.pdf.
[12] http://www.ecy.wa.gov/climatechange/docs/2012GHGtable.pdf

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BEFORE THE

Cowlitz County and Washington State Department of Ecology

Millennium Bulk Terminals-Longview
SEPA Draft Environmental Impact Statement

June 10, 2016

Please accept these comments on behalf of the Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART TD). SMART TD is the largest railroad operating union in North America and we represent employees on every Class I and Class II railroad, as well as employees on many regional and shortline railroads. We serve as the voice for over 125,000 active and retired workers, drawn predominantly from the operating crafts in the railroad industry, including conductors, brakemen, switchmen, ground service personnel, locomotive engineers, hostlers, and workers in associated crafts.

Nearly one in five railroad jobs in America is directly linked to hauling coal, and consequently many SMART TD members have been adversely affected as coal shipments have dropped dramatically. Overall coal shipments are down 30% this year compared to last year, and we currently have around 10,000 members on furlough.

SMART TD members have been operating trains that safely carry coal through the state of Washington for decades. Prior to the announcement of the recent proposals to construct new coal export terminals – and significantly bolster railroad jobs – there has never been major objections or concerns about the health or safety of moving coal in Washington or any other state. Safety has been a key focus of our union for more than 100 years and handling coal has never been a significant safety concern for our members.

The release of the draft environmental impact statement (DEIS) for Millennium Bulk Terminals marks a significant step toward construction of a project that would help preserve critical railroad jobs and create good paying union jobs in construction and at the port itself. However, the proposed mitigation requirements for greenhouse gas emissions contained in the DEIS would likely kill this project.

We are unaware of any other permitting process that has attempted to impose a mitigation requirement on a facility based on the greenhouse gas emissions generated from the movement of a commodity, or the use of the finished product once shipped. Nor has any manufacturer or transloader been required to mitigate for the end use of the product in another country.

This unworkable requirement will set a terrible precedent that that could affect future exports if retained in the final EIS for Millennium. For example, if this mitigation requirement is applied to exporting Boeing aircraft, which produce tremendous amounts of CO2 emissions, it would force Boeing to shut down their Washington operations and build their aircraft elsewhere. It would also adversely affect exports of scrape steel headed to smelters, or agricultural commodities that are grown in a less than stellar manner. The list is endless and really would call Washington's role in future shipping into question.

We believe that a decision by the state of Washington to impose a greenhouse gas mitigation requirement for the movement of goods by rail will have a chilling effect on the development of new projects in the state. This new requirement runs the risk of imposing high additional costs on any products moved through the state by rail, and will discourage needed investment in ports and other projects. This will only serve to jeopardize the jobs that would be created directly and indirectly by these projects.

For the record, we believe in global climate change. That being said, America and the rest of the world will be burning a lot of coal for decades. Since that is the case it makes sense for the health of our planet to burn high quality, low sulfur, low mercury coal that is mined properly with strict reclamation standards, such as Powder River basin coal. If this project is not approved, or if it is approved with this onerous provision, it is likely that poor quality, higher sulfur and mercury coal will be burned in its place and America will lose out on creating some desperately needed good paying jobs.

On behalf of the SMART TD, we respectfully request that you eliminate the proposed mitigation requirements for greenhouse gas emissions contained in the DEIS. It is a troubling precedent that will impose high costs and likely kill this project and future projects that depend on rail transportation.

Thank you for the opportunity to comment.

John Risch
National Legislative Director
SMART- Transportation Division

SMART-Transportation Division (3406)

Legislative Representatives:
Local # 117 – Timothy Burch
Local # 161 – Patti Otani
Local # 324 – Todd Kester
Local # 426 – Darren Volland
Local # 556 – Kirk Sides
Local # 845 – Tracey Council
Local # 855 – Steve Mazulo

Legislative Representatives:
Local # 977 – Gary Howell
Local # 1238 – Shane Sadler
Local # 1348 – Herb Krohn
Local # 1505 – Donald "Bud" Newton
Local # 1637 – Clyde Rosa
Local # 1713 – Dwayne Hawkins
Local # 1977 – Travis Anderson

Washington State Legislative Board

Representing Railroad Train & Bus Service Employees of Washington State

11225 Roosevelt Way N.E., Seattle, WA. 98125
Washington State Legislative Board Executive Committee:
Herb Krohn – Washington State Legislative Director – 206-713-5442 email: hskrohn55@hotmail.com
Steve Mazulo – Assistant Legislative Director
Gary Howell – Board Chair and Alternate Legislative Director
Todd Kester – Secretary; Clyde Rosa – Vice Chairman

June 12, 2016

Washington State Department of Ecology and
Cowlitz County Department of Building and Planning,
Millennium Bulk Terminals Longview Draft EIS,
c/o ICF International,
712 Second Ave., Suite # 550,
Seattle, WA. 98104

re: Submission of Written Comments on Draft EIS

Please consider these comments on behalf of the two thousand Washington State members of our organization who work as railroad operating craft employees across our state.

We assert that one of the most through EIS research projects ever in the history of our state has been completed in addressing concerns regarding this proposed development; no other similar project has ever been subjected to such intense scrutiny. We have grave concerns regarding the precedent of imposing such conditions to address greenhouse gas emissions from product origin, all transportation aspects, to consumption and disposal in other nations in order to complete this EIS. By engaging in such commodity partiality, it could open the door to blocking transportation and marketing of any and every commodity anyone might consider objecting to including Boeing Aircraft, automobile parts, even GMO grains or agricultural products; so we urge you to remove such considerations from the final document.

Please also consider that this proposal as well as other similar proposed projects constitute long term export terminal infrastructure for Washington State that will provide solid middle income jobs for workers locally, as well as railroad workers across the entire western U.S. for many decades into the future. Long after coal ceases to be a major source of energy generation this facility will be capable of handling many other bulk mineral commodities for export. Consider that if this project were not come to fruition it will only hasten the expansion of similar facilities in British Columbia, Canada so the resulting facility jobs will be exported along with the commodities being transported.

We strongly support approval of this proposal, and request that only GHG mitigation conditions for carbon emissions directly related to the actual operation of this facility be required. Neither railroad or ship transportation, nor destination commodity use mitigation requirements are appropriate for the operation of this or any other export facility. No other export terminal anywhere in the world handling similar commodities are subjected to such standards; to require Millennium to such an unusually onerous standard would place all of our nations export commodities and systems in peril in the future.

Therefore, we request that such extremely burdensome and unreasonable requirements be omitted from the final EIS so that this project is permitted to move forward in the interest of our economy and our nation's middle class workers and our economic future.

Thank you for your consideration of our concerns.

Very Truly Yours,

Herb Krohn
Washington State Legislative Director
SMART-Transportation Division formerly United Transportation Union

Submission Number: ***TRANS-LV-M2-00038***

Received: 5/24/2016 12:00:00 AM
Commenter: Herb Krohn
Organization: Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART TD)
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good afternoon. I'm Herb Krohn. I'm state legislative director for UTU SMART Transportation Division. We represent over 2,000 railroad workers including brakemen, switchmen, conductors across our state.

This facility is critical to not only the 5,000 rail workers in Washington state, it's imperative to the thousands of railroad workers and their families across the Pacific Northwest and Western United States, many who are currently laid off and need to pay the rent and put food on their families' tables.

This project will provide long-term middle class export jobs for the next 100 years or more, long after the burning of coal ceases to be a major source of electrical generation. We need this to create and preserve rail and import jobs.

The EIS shows that this project will have no impact on the world coal market. If it isn't built it won't stop even one lump of coal from being burned in the world. The use of Powder River Basin coal is a harm reduction technique to reduce the emissions of sulfur dioxide, reducing acid rain and acidification of our oceans and the harm to our endangered fisheries.

If this project is not built other coal will be used causing even greater harm to our environment. So if this project is not built, only two things will happen: Thousands of good-paying, middle class, American jobs will be exported to other countries and even greater harm to our environment will occur by the burning of dirtier coal that will certainly result.

In exchange, you get the superficial satisfaction from those who illogically believe that stopping this project will actually improve the environment. Let's put Americans back to work, let's support our families, let's rebuild our middle class, let's reduce environmental harm, and let's build this project now.

Thank you.

Submission Number: ***TRANS-PASCO-M2-00047***

Received: 6/2/2016 12:00:00 AM
Commenter: Burt
Organization: Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART TD)
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
I'm Burt, director for the Smart Transportation Division representing 2,000 rail workers in our state.

The real controversy of this project centers on the export and use of fossil fuels and global warming. There is no free lunch, there is no clean energy. All energy sources have environmental impacts, nuclear waste, dams flood and kill fish, windmills kill birds, solar panels and windmill motor manufacturing creates toxic chemical residues. Every energy source has a major environmental impact.

We're all responsible for global warming, every one of us. Many here today are using laptops, cell phones, and electronic devices all made in factories in Asia using electricity from coal.

We came here in vehicles burning fossil fuels. Even our bikes are made in Asian factories using coal generated power. Our possessions, food, and (inaudible) are all transported by ships, trains, planes all using fossil fuels.

It's hypocrisy for folks to claim a high moral high ground while benefiting from coal energy and fossil fuel consumption. No one is without guilt.

Today more people live in Asia without any electricity than the entire population of the United States. Opposition to these exports is a form of radical environmental economic imperialism to deny people from emerging nations the ability to improve their lives while we enjoy modern conveniences.

We cannot solve this global problem at a local level. Let's each find worldwide solutions to global warming as the world did when (inaudible). The use of American Powder River's coal, low sulfur, is a temporary reduction action to lower sulfur dioxide until the world ceases using coal. This terminal will help reduce coal's environmental damage now. Thank you.

Submission Number: ***TRANS-SPOKANE-M2-00042***

Received: 5/26/2016 12:00:00 AM
Commenter: Herb Crohn
Organization: Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART TD)
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Good evening. I'm Herb Crohn, the State Legislative Director for SMART Transportation, a division representing 2,000 railroad workers in our state. There is no free lunch. All our energy sources have negative environmental impacts. Nuclear waste, dams, flood lands that kill fish, wind mills kill birds. Making solar panels and wind mill motors generate very toxic residues.

Every energy source used in the world have grave environmental consequences. We need world-wide solutions to global warming instead of vilifying commodities at each other. We are all responsible for global warming.

Many of us sit here using cell phones, laptops, other electronic devices, and guess what, these products are all made in factories in Asia, using electricity generated from coal.

Many of us will leave today in vehicles burning fossil fuels. Even our bicycles made in Asian factories powered by electricity are generated by coal.

Most of our possessions; food and manufactured goods are transported by ships, trains, and trucks powered by fossil fuels. It's hypocritical to claim the morale high ground by opposing this project while each and every person here benefits from electricity from coal and burning fossil fuels as a consumer. No one is without it. There are more people in Asia and India today who still have no electricity in their homes than the entire populations the United States.

Opposing this project amounts to supporting the U.S. policy of radical, environmental, and economic imperialism by denying the lights of emerging nations to improve their families' lives while we here enjoy our modern conveniences.

Let's get past trying to solve a local problem at the local level, reduce acid rain in the United States, grant these permits and let's work to address global warming nationally and globally, like the world did with freon and ozone damage in the 1980s. Thank you.

Submission Number: ***MBTL-SEPA-DEIS-0001183***

Received: 5/25/2016 8:47:39 PM
Commenter: Alan Journet
Organization: Southern Oregon Climate Action Now
State: Oregon

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Since we know as clearly as we know anything that we must leave fossil fuels in the ground if we wish to leave future generations a livable planet, it is equally clear that we cannot afford to export these fuels.

Submission Number: ***MBTL-SEPA-DEIS-0002352***

Received: 6/9/2016 5:36:43 PM
Commenter: Mitchell Smith
Organization: Southwest County Coalition
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

As proposed the Millennium Bulk Terminals-Longview (MBTL) will be a disaster for residents living near the railroad tracks that transport the coal to the proposed project. The draft EIS does little to alleviate those concerns as quite simply Emergency Response vehicles cannot jump over coal trains. A couple minutes will always make the difference between life and death, whether a home is saved or completely destroyed. During the Fish Lake Fire in Spokane County in 2015 Emergency vehicles were observed being delayed by coal trains. Every Railroad Crossing would need an overpass to ensure public safety and that is not even proposed. The final EIS must address the fact that ambulances cannot jump over coal trains and find a way to mitigate the losses. Worse is the railroads themselves have a horrible safety record as witnessed by the derailment last week along the Colombia River. For those of us that live next to the tracks the RRs are not our friend, we consider them to be Serial Arsonist. Every year their trains start fires and nobody - not one single agency does anything about it. The victims are paid and the RRs just do it again next year and again no one does anything. The final EIS must address the Wildland fires that will be a result of increased Coal train traffic. The Cumulative effects must be addressed and mitigated in the final EIS. Lastly the SWCC is concerned with corruption by local officials that may have received favors from RR entities to come out in support of the proposal. Promised jobs, donations to department training funds, offers to attend paid junkets to seminars put on by the Rail Roads, or just the use of RR property by county officials. Almost every issue the SWCC dug into when public officials openly supported coal or oil trains revealed some public official was receive something in return for their support. Legal or not it makes the MBTL look as if the process has been corrupted. The final EIS must address this issue, the SWCC that every part of the proposed project must be open and honest = no back room deals. Thank You for the opportunity to comment. Mitch Smith Lead Organizer SWCC

SCKC

SPOKANE CANOE & KAYAK CLUB

May 15, 2016

Department of Ecology, State of Washington

The Spokane Canoe and Kayak Club strongly disagree with the permitting of the Millennium Bulk Coal Terminal in Longview, WA for these reasons:

The issue of multiple mile-long coal trains passing through our community each day degrading the lifestyle of this community with addition transportation backups, noise and pollution is unacceptable.

These trains cross the Spokane River above critical spawning habit for the threatened Spokane Redband trout. Recent examinations of the trestles in that area show significant degradation. A train accident of any kind could destroy this section of the Spokane River for future fish spawning.

The Spokane River is an iconic symbol of our community. It is used by thousands of residents and visitors for recreational boating and fishing.

As the United States and the Pacific Northwest Region tries to tighten our environmental regulations and clean up the mercury in our water and air, it is illogically to send our coal to China. China puts out more mercury pollution than the rest of the world combined. That mercury, sulfate, ozone and black carbon doesn't stay in Asia, it blows right back over the Pacific on to us, making it more difficult for us to clean up our own water and air.

In addition, because of many factors, the coal industry is dying. This proposed terminal is a last ditch effort for the coal producers to make money. This is at the expense of the wellbeing of the citizens and wildlife of the Pacific Northwest. Please do not approve it!

Stanley J. Mrzygod Jr.

President, Spokane Canoe and Kayak Club

P.O. Box 819, Spokane WA 99210

Submission Number: ***TRANS-SPOKANE-M2-00010***

Received: 5/26/2016 12:00:00 AM
Commenter: Stan Mrzygod
Organization: Spokane Community Kayak Club
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. Stan Mrzygod, Spokane, Washington. I'm the president of the Spokane Community Kayak Club, and we have over 200 members.

The Spokane Community Kayak Club strongly disagrees with the permitting of the Millennium Bulk Coal facility. The issue of multiple mile-long coal trains passing through our community each day degrades lifestyle of the community with the additional transportation backups, noise, and pollution. This is unacceptable.

These trains cross the Spokane River, above critical spawning habitat for a threat of a Spokane/Redman drought. A train accident of any kind could destroy the section of the Spokane River for future fish spawning.

The Spokane River is an iconic symbol of our community. It is used by thousands of residents and visitors for recreational boating and fishing.

And as the United States and the Pacific Northwest region tries to tighten our environmental regulations and clean up our water and air, it is so illogical to send our coal to China.

China puts out more pollution than the rest of the world combined. That air pollution doesn't stay in Asia. It blows right back over the Pacific Northwest on us, making it more difficult for us to clean up our own water and air.

Climate change is real. Last week late in the evening it dropped to its lowest levels since construction the Boulder Dam in 1935. This is a long-term effect.

Forty million people in seven states are being affected. Spokane River, right outside our back door here, almost ceased to flow last year.

This terminal is at the expense of the well being of citizens and wildlife in the Pacific Northwest. Please do not approve it. We endorse the no action option. Thank you.

Spokane RIVERKEEPER®

Clean River ♦ Healthy Community

June 13, 2016

Diane Butorac
Regional Planner
Southwest Regional Office
Washington Department of Ecology

Dear Diane,

I am making the following comments on behalf of the Spokane Riverkeeper. The Riverkeeper program works for a fishable and swimmable Spokane River and endeavours to protect it from those forces that threaten its health and the well-being. The Spokane River is the heart and soul of our city and a healthy river is essential for a healthy community.

The Spokane Riverkeeper believes that the construction of the Millennium Bulk Coal Export Terminal will have several major impacts on our river and our community. The Draft Environmental Impact Statement (DEIS) addresses some of the potential impacts, but does not take seriously other impacts that this facility would have on our communities and the Spokane River. As such, the Spokane Riverkeeper opposes construction of the Millennium Bulk Coal Export Terminal, and urges the Washington Department of Ecology and Cowlitz County to take the "no action alternative."

- **Coal dust has a destructive impact on communities and infrastructure**

The proposed railroad could eventually carry 16 coal trains per day. The DEIS identifies that " Day to day rail operations could release contaminants into water resources immediately adjacent to the rail line, resulting in the potential for water quality impairment from increased rail operation." (S-24), but the DEIS fails to take these impacts seriously. Much of this coal would ultimately travel on through Spokane to terminals across the Spokane River and over hangman Creek, on to the West Coast. BNSF studies have shown that each coal car loses as much as 500 lbs of raw coal from uncovered cars each trip. These cars travel adjacent to our river and two tributaries to our river. Spokane Riverkeeper volunteers have found coal in the creeks and along the banks of these rivers from the train traffic carrying loads of coal. This dust is laden with heavy metals and is toxic to humans and to aquatic ecosystems. The construction of the railroad will discharge more coal and coal dust into our waterways and into our urban neighbourhoods. Additionally, coal dust has been shown to have a negative impact on rail

infrastructure in that the dust is corrosive and weakens rail lines. Spokane is the site of accelerated volatile crude oil-by-rail traffic, and weakened rails increase the odds of a catastrophic rail accident and consequent oil spill and or fire in our community or in our river.

- **The global combustion of coal is depriving our river and community of water**

The DEIS states that the proposed Millennium Bulk Terminals will in the emission of 27 million tons of CO2 per year running at full capacity. This could increase the Greenhouse gas footprint of Washington State almost 30%. The combustion of coal across the earth has been shown to have extreme effects on the Pacific Northwest climate by emitting greenhouse gasses. The impacts of this combustion on the Spokane River cannot be denied nor understated. Nor can these impacts be mitigated. The development of the proposed Millennium Bulk Coal Export Terminal will only exacerbate the effects of climate change that are already accelerating. In 2015, the snow pack in the mountains that feed our river was at an all-time low, an impact felt by extremely warm waters off in the Pacific Ocean. The winter of 2016 saw normal snow packs, but such high temperatures that the snow melted far earlier than normal annual averages. At this moment, our river is running at 3220 cubic feet per second (CFS). The annual mean flow for this time of year is it 11,800 CFS making our current flow near 25% of normal at the front end of the dry season. These low flows and correlated low snowpack are indisputably the result of a new emerging climate regime. Projections by the prestigious University of Washington Climate Impacts Group projects the complete loss of the snowpack that feeds our river by 2080 if we do not reduce carbon emissions. They follow the predictions and modelling of multiple scientific efforts to understand climate change. In light of this unfolding climate change, expanding the capacity or coal fired energy in Asia is to actively destroy our river. Our citizens and our businesses are being deprived of a community asset that has been the foundation our culture, economics and history since its founding.

- **The global combustion of coal is poisoning our water and our fish with methyl mercury**

The combustion of coal in Asia has been shown contribute toxic, methyl mercury into Pacific Northwest waterways. Asia emits over 1500 tons of mercury a year and much of that is returned to our waters due to atmospheric transport. According to sources at the National Oceanic and Atmospheric Administration, mercury and other airborne contaminants collect over China during the winter and spring until Siberian winds arrive bearing dust from expanding Chinese and Mongolian deserts. Every five or six days, the winds flush out eastern China, sending dust and industrial pollutants such as ozone precursors high over the Pacific and on to our rivers where it bio-accumulates in virtually all of our fish species. We in Washington State and Spokane, currently have mercury related fish advisories (Department of Health) for all of our species of fish. No one can eat fish without worrying about the effects of methyl mercury.

- **Project impacts on public health and quality of life**

The DEIS is silent on the air quality problems created in the Spokane Valley by an additional 16 coal trains per day. As stated above, Union Pacific and BNSF rail lines travel through the heart of our downtown corridor in Spokane as they do in the towns of Millwood and Spokane Valley. These trains deliver large amounts of diesel exhaust. In the winter months our valley suffers severe air quality problems due to its temperature inversions. These inversions trap air pollution and particulates and leave our community exposed for weeks. According to the Spokane Regional Clean Air Authority (SRCAA), Diesel particulate pollution is responsible for numerous public health issues in our community. (SRCAA Fact Sheet: https://goo.gl/OApXP3)

SRCAA Fact Sheet Excerpt:
*"**What is the concern with diesel pollution?***

Diesel exhaust is made up on tiny, highly toxic particles that penetrate our lungs and remain there indefinitely to create and/or worsen both heart and lung conditions. Exposure to diesel particles is linked to immediate and long-term health effects, including:

- *irritation of the eyes, nose and throat*
- *coughing, laboured breathing, chest tightness and wheezing*
- *making healthy children and adults more susceptible to developing respiratory conditions*
- *increased risk of heart attack or stroke for those with pre-existing heart disease or circulatory problems*
- *lung cancer"*

According to the SRCAA, diesel exhaust is currently responsible for 12% of the particulate pollution in the Spokane Valley. If oil train traffic increases by 9 loaded and unloaded trains per week, our city is going to feel the impacts of this traffic with increasing public health problems and increasing problems with air quality. This is clearly an impact to our community that should be addressed in the DEIS.

Additional issues resulting from the proposed Millennium Bulk Terminals Projects include traffic problems for the public, for emergency first responders, school busses, commercial trucking traffic, commuters and others.

The DEIS currently call out the following potential issues and impacts:

Rail Traffic Impacts:

- *"Trains related to the Proposed Action could affect accessibility to community resources and public services during peak travel times because of increasing wait times at grade*

crossings along the Reynolds Lead, BNSF Spur, and BNSF main rail line." Summary at S-12.

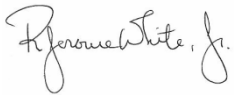
- *"Trains related to the Proposed Action would also increase emergency vehicle delay at rail crossings. The total gate downtime would increase over 130 minutes a day at crossings along the Reynolds Lead and BNSF Spur, and up to 20 minutes a day at the study crossings along the BNSF main line." Summary at S-32.*
- *Table 6-6 shows every segment on the rail system greatly over capacity if all proposed projects, including coal and oil, are built.*
- *Table 6-7 shows a significant increase in train accidents (this analysis includes oil trains).*
- *Table 6-9 shows unacceptable level of service at multiple rail crossings due to delays from cumulative projects.*

Rail traffic already causes traffic to idle for hundreds of hours a month. There are over 75 road and rail intersections in the Spokane Valley. Long waits due to rail obstruction is a regular occurrence for those who live and work in the Spokane Valley. The City of Spokane Valley has studied the Barker Road crossing and calculated there are 23,100 hours of vehicle delay annually on that one intersection alone. This translates to 232 tons of air pollution a year from idling cars. The proposed Millennium Bulk Coal Terminal Projects would increase rail traffic by another 16 trains per week and therefore pose direct and negative impacts on the people of our community. The Draft Environmental Impact Statement does not address these impacts.

The construction of the Millennium Bulk Coal Terminal facility will have lasting negative impacts on our world, our local community and our Spokane River. The costs of this rail road project in terms of environmental impacts far outweigh any short term benefits. We urge the WDOE and Cowlitz County to take the "no action alternative".

Thanks for the opportunity to comment.

Respectfully,



Jerry White Jr.
Spokane Riverkeeper

35 W Main St Suite 300
Spokane WA 99201
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Sravasti Abbey Corp (3464)

Sravasti Abbey

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Geshe Kalsang Damdul
nstitute of Buddhist Dialectics

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Washington State Department of Ecology and Cowlitz County Officials June 7, 2016
c/o ICF International
710 Second Ave, Suite 550
Seattle, WA 98104

RECEIVED
JUN 10 2016

Subj: Millennium Bulk Terminals Draft EIS

I write today on behalf of all the monastics of Sravasti Abbey, a Buddhist center of learning and practice located near Newport, Washington and in close proximity to the many downline communities in eastern Washington and northern Idaho affected by the proposed Millennium Bulk Terminals in Longview.

We at the monastery have dedicated our lives to the Buddha's teachings and strive to embody the values of compassion, respect for nature, and service to all beings. Because of our values, we raise our voices in strong opposition to the permitting of the Millennium Bulk Terminals.

From a global perspective, the Longview terminals will enable more climate changing coal to be extracted from the Powder River Basin, shipped through our communities, and burned in coal fired power plants abroad. This proposed terminal imperils humanity and all the creatures of our earth. In an age where the impact of advancing climate change is all around us, it is an immoral act to facilitate and expand the mining, shipment, and combustion of this dirtiest of fossil fuels - coal.

From a local perspective, coal's contribution to climate change is not abstract. We live close to the land and know all too well that our winters are shorter, our snow pack is less, our summers are longer and hotter, and wildfire threatens us for more and more weeks each year. And, we know that when rain does come, it is laced with mercury carried on the winds from places in East Asia where Powder River Basin coal is burned today, with more to be burned if you approve the Millennium Bulk Terminals. The draft EIS concludes that the terminal would have significant climate impacts ranging around 3.2 million metric tons of CO2 annually. When we consider that is equivalent to adding about 670,000 passenger cars on the road each year, the ultimate permitting of the terminals is completely irrational.

Our closest neighbors are even more affected by the proposed terminal. Communities like Spokane Valley, Spokane, and Cheney in Washington and East Hope, Sandpoint, Athol, Rathdrum, and Hauser in Idaho are the ones to carry the brunt of more coal trains. Sixteen more trains per day by itself may not seem significant. When added, however, to existing coal train shipments, to Bakken and Albertan oil train shipments, and the regular flow of agricultural and manufacturing shipments, the cumulative impacts put citizens at far greater risk. Marked delays for emergency vehicles at crossings, increased diesel particulate from multiengine trains,

Sravasti Abbey
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elevated noise levels, and reduced property values are but a few of the "human costs" of the proposed coal export terminal.

Mindful of the interconnectness of all life and living in the state of Washington, we are aware of Governor Inslee's presence at the United Nations Climate Change Conference in Paris, France last December. We were greatly encouraged when he signed international agreements promoting climate action and said, "This is an opportunity to renew our commitment to fighting carbon pollution and work across borders to find creative solutions to climate action. Washington is not alone when we act on climate…" We urge you to sharpen your assessments of the climate impact of the Millennium Bulk Terminal in the final EIS so that we may all live up to the pledges made by Governor Inslee.

His Holiness the Dalai Lama, spiritual leader and recipient of the Nobel Peace Prize, recently reminded us, "Religious leaders have a duty to speak out about climate change." Pope Francis, another respected spiritual leader, has recently called on people to take measures to prevent and remedy global warming. As dedicated followers of the Buddha who care about the future of all beings on our planet, we raise our voices in strong opposition to the permitting of the Millennium Bulk Terminals.

Venerable Thubten Chodron

Venerable Thubten Chodron

Submission Number: ***MBTL-SEPA-DEIS-0001764***

Received: 6/2/2016 4:31:36 PM
Commenter: Byron Baker
Organization: Stewards of the Greys
State: Wyoming

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

I am the president of a Wyoming recreation organization called Stewards of the Greys. We support th action to build a coal terminal in Cowlitz County, Washington along the Columbia River because I care about: 1. Providing Coal to countries outside the USA. Third World Countries need fuel to exist. We need to provide it, cheaply. 2. The coal terminal will benefit Wyoming residents by creating Jobs and tax revenues. 3. The coal terminal would have no negative environmental effect to Cowlitz County or the it's waterways. Many Thanks, Byron Baker SOTG

June 10, 2016

Dear Co- Lead Agencies:
Please accept these comments on the DEIS for the Millennium Bulk Terminal proposal in Longview WA. These comments are on health impacts. We will be submitting comments on other concerns separately. Health has to be talked about within the context of environmental justice or intersectionality. While this issue was looked at, at the site of the proposal, it is clearly lacking in regards to the rail communities that are connected to this proposal. It is a grave omission to not consider rail communities and health in the DEIS. In fact, it is an action of environmental injustice to not consider health impacts to communities outside of Longview and especially outside of the state of Washington. The proposed facility does not exist in a vacuum, and the trains that may travel along the rail routes will have very real and negative impacts on the hundreds of communities from the Utah and PRB mines to Longview.

Often low income and persons of color communities live near tracks all along the rail lines from mine to terminal. Moving is not an option to get away from the impacts of coal dust, diesel particulate matter, and noise, long waits at at-grade crossings, accidents at crossings, potential derailments, and fires started by trains, and so forth. People who live along the tracks cannot afford to move or they don't want to. Those that don't want to have investments in their neighborhoods, for many reasons. Some families live, work or have children that go to the schools near tracks. For some families, they have constant exposure to trains because they live and work near tracks or their children live and go to school near tracks or railyards. These conditions noted above, that is, coal dust, etc. already exist and will be compounded with more trains that this facility, if built, will bring.

The fact sheet on "Social and Community Resources" on the project says that "A separate report, a Health Impact Assessment, is being prepared for the proposed project. This report will use the analysis in the environmental study to consider impacts on human health." The HIA should have been done by the time the DEIS was released. Children, the elderly, pregnant women, persons with health conditions like chronic obstructive pulmonary disease, asthma, diabetes and heart disease, and women over 50 are particularly susceptible to the negative health impacts of coal. Health impacts are greater on children because they drink, eat and breathe more than adults do. Please see the work of Oregon and Washington Physicians for Social Responsibility via their websites that provide many scientific studies on health concerns and studies. In addition, there are links to air pollution and noise studies at the bottom of these comments.

We request that the HIA, when completed, thoroughly looks at the following impacts and includes a public comment process:

1. Please show a pollution contours map (isopleths) that will look at the Diesel Particulate Matter (DPM) and other toxins that people will be exposed to up to two miles from the track at various distances, that is, 50 feet, 100 feet, 200 feet etc.
2. Please show how many people live within the above feet distances along the entire transportation routes, and have that analysis also include projected populations. How many of them are children, the elderly, people of color, and have underlying diseases, and live in poverty?

3. List the number of schools, hospitals, assisted living facilities, libraries, and other places that people congregate on a daily basis within two miles of the tracks along the transportation routes.
4. Show the increased risks for heart attacks, strokes, COPD exacerbations, pulmonary and cardiovascular disease, cancer, asthma, ER visits, etc. from increased DPM on current and projected populations. Who pays for the costs and what are the economic costs?
5. Particular attention needs to be paid to communities near a rail yard, and not just tracks. Please read "Experiences of a Rail Yard Community: Life is Hard," in Vol. 77 Number 2 of *Journal of Environmental Health*, September 2014.

Coal dust is spread along our rail communities via uncovered hoppers. Depending on weather conditions, it can be spread across the landscape into water, farmland, towns, playgrounds, parks, etc. at varying distances. Coal dust has microscopic pollutants that are harmful to health. Chronic bronchitis, emphysema and difficulty breathing can result from inhalation of coal dust. Eating food and fish contaminated with coal dust can introduce these toxins to your body as well. Coal dust can also contain lead, mercury and arsenic. The Washington Department of Health's letter on the Gateway Terminal proposal at Bellingham stated the above.

Diesel Particulate Matter combined with coal dust has significant special health problems. Please see the Daniel Jaffe study done on coal trains in the Columbia River Gorge in November of 2015. Dr. Jaffe is a professor of atmospheric and environmental chemistry at the University of Washington. His study was published in the journal *Atmospheric Pollution Research.*

The 16 trains generated by the proposed MBT in uncovered cars could have real consequences for health along the rail routes. In just over 400 miles of rail travel the average 125-car coal trains would emit 12,125 pound of coal dust, even under good conditions. We request the HIA to show:

1. The effects of coal dust and spills along the rail routes, especially on farmland, waters, and grazing animals used for human consumption.
2. How many children, elderly, those with health problems, etc. will be exposed to coal dust?
3. The life of the MBT terminal is 50 years. The study should look at the cumulative effects of coal dust and health during the operation life of the terminal along the rail ways.
4. Will the coal dust need to be cleaned up? If so, how much will it cost and who pays for it?
5. Look at the return cars on the way back to the mines. Carryback coal is in the hoppers since they are not completely emptied at the terminal. Please analyze the loss of the residual dust from the carryback coal.

Noise pollution is a known contributor to health problems. According to Oregon Physicians for Social Responsibility it can cause sleep disturbance, cardiovascular disease, stroke and ischemic heart disease, cognitive impairment in children, hypertension, arrhythmia and increased rate of accidents and injuries along with an exacerbation of mental health disorders. It is difficult to get a Federal Railroad Administration approved quiet zone in train neighborhoods. The HIA should:

1. Determine which rail cities are at greater risk for noise and vibration, and who lives in those communities. Please use noise isopleths.
2. Look at squeaking wheels, train engines horn blasts within 50, 100 feet and so on for up to two miles along the entire transportation routes.

3. At grade crossings have horns blowing. How many at grade crossings are there on the rail routes? How many trains go through, of all kinds, are on the tracks. At what times? How many are during the typical sleeping hours?
4. Interviews should be conducted in higher risk communities for noise about sleeping patterns, concerns, and disturbances. Please also look at the research on noise pollution and especially train noise pollution.
5. What if train noise can't be mitigated who pays for health care increases that may result from increased noise pollution?

Emergency Services: At grade crossings block vehicular traffic irritating drivers but sometimes causing delays in emergency services for fires, and most especially medical emergencies.

1. Look at at-grade crossings in all rail communities and determine the most vulnerable by calculating the number of all trains crossing the tracks.
2. Look at all the unprotected rail crossings that exist on the rail lines. Only 44 rail crossings were studied in Washington State but there are hundreds on the rail lines.
3. Consider in the study that emergency vehicles have to often cross twice at at-grade crossings coming and going to an emergency. Some of the rail lines are double-tracked. That presents a situation that increases train traffic, even if one train has passed, another may stop a vehicle on the way back through the crossing. Double and triple train track crossings need to be inventoried.
4. Look at alternative crossings that emergency vehicles could use, and how long it would take them.
5. What are the anticipated coal train derailments along the routes?
6. Is there a system available for EMS vehicles to be notified of trains crossing at –grade? If so how much is it and who pays for it?
7. What are some of the foreseeable consequences if a fire burns down a building before first responders can get to it or someone dies en-route to hospital because trains are blocking the way?
8. What is the psychology of community members and first responders worried about at grade crossings and trains blocking it in emergencies?

Drinking Water: Communities can't live without drinking water. Often our drinking water also is a part of water use in our activities of daily living.

1. Identify all sources of drinking water, domestic and municipal, for rail communities in the HIA.
2. How many people are served by the drinking water systems?
3. If drinking water is harmed due to derailments or pollutants, who pays for alternative sources of drinking water?
4. Who will pay for the monitoring and clean up of the drinking water?
5. Identify all EPA sole source drinking aquifers. What are the consequences for a contaminated aquifer especially within the context of the EPA designation?
6. What would contamination of water do to recreation and fishing especially with water used for drinking, wildlife and recreating?

Health Impacts of Climate Change: The DEIS says that about 37.6 million metric tons of greenhouse gas emissions would occur over a 20 year period, if the terminal is built. This includes construction. The fact sheet states that possible impacts from greenhouse gas emissions are global. They could increase forest

fires, melt more snow and ice, cause risks to forests, fish, wildlife, agriculture, freshwater supplies, tourism, irrigation and so forth. These all have health risks. The HIA should:

1. Consider the impacts of increased forest, field and brush fires on rail communities.
2. Consider the impacts of increased heat on urban communities. Heat waves cause more deaths in the world than cold streaks.
3. What populations are most vulnerable to global climate change and why?
4. Will severe weather due to global climate change cause problems such as heavy winds and rain, landslides, etc. Who will pay for the deaths, injuries and the relocations of those who suffer from any of the above?
5. Will we see an increase of West Nile Virus or Lyme diseases or others as the climate warms?
6. What about impacts that is disproportionate on low income communities and communities of color? They need to be studied.

Surfactants: Coal is uncovered and at the mines it is applied to keep coal dust down. But we know little about it. The HIA should consider

1. Which surfactants will be used?
2. What are the hazards to humans who apply it, and who breathe it in during transit?
3. Have any of the surfactants been tested for chronic toxicity?
4. What are the longer term human and environmental health impacts?
5. Can it leach out of cars during rainstorms?

In conclusion, please read the studies below and include a thorough, detailed, mines to rails to facility HIA. Thousands of people in Spokane County alone will be exposed to increased air pollution from the sheer number of trains from this proposal.

Sincerely,

Laura Ackerman
Organizer and Director
The Lands Council
Spokane, WA

Air pollution exposure may worsen lupus in children

09 Jun 2016

The results of a new study show for the first time that an individual's exposure to air pollution may have a direct role in triggering disease activity as well as airway inflammation in children and adolescents with systemic lupus erythematosus. Excerpt: The WHO has estimated that one in eight of total deaths globally are the result of air pollution exposure, confirming air pollution as the world's largest single environmental health risk. Air pollution is estimated to cause nearly half a million premature deaths each year in the European Union.

Air Pollution Exposure During Pregnancy Linked With Asthma Risk
Feb. 9, 2016 —

Road Traffic Pollution as Serious as Passive Smoke in the Development of Childhood Asthma
Mar. 21, 2013

One in 20 Cases of Pre-Eclampsia May Be Linked to Air Pollutant
Feb. 6, 2013

Exposure to Air Pollution During Second Trimester of Pregnancy May Be Associated With Increased Asthma Risk in Children
May 19, 2014

Explaination for Increased Asthma Severity in Children Exposed to Diesel Exhaust from Traffic
Sep. 23, 2013

Fine Particulate Air Pollution Linked With Increased Autism Risk
Dec. 18, 2014

Exposure to Traffic Pollution During Pregnancy Can Damage Future Child's Lungs
Oct. 20, 2014

Air Pollution May Affect Levels of Obesity-Related Hormone
Sep. 8, 2014

Traffic-Related Air Pollution Associated With Changes in Right Ventricular Structure, Function
Mar. 7, 2014

Pregnant Mothers at Risk from Air Pollution, California Study Suggests
Oct. 7, 2011

High-Pollution Days Linked to Increased Risk of Cardiac Arrest
Oct. 7, 2014

What Happens on the Molecular Level When Smog Gets Into the Lungs?
Sep. 16, 2015

Air Pollution Increases Risk of Early Death in Gothenburg
Mar. 24, 2016

New Research Shows Air Pollution Can Reduce Children's Lung Function

Date: September 9, 2004

Even Low Levels of Air Pollution Appear to Affect Children's Lung Health
Apr. 25, 2016

Air pollution associated with higher rates of chronic kidney disease

Date: November 16, 2014

Elderly Have Higher Risk For Cardiovascular, Respiratory Disease **...**
Mar 9, 2006

Evidence growing of **air pollution's** link to heart disease, death **...**
May 11, 2010

Ethnic minorities, deprived communities hardest hit by **air pollution ...**
Jan 26, 2015

Exposure to particulate **air pollutants** associated with numerous **...**
Apr 29, 2016

Air pollution below EPA standards linked with higher death rates **...**
Jun 4, 2015

Long-term exposure to **air pollution** may pose risk to brain structure **...**
Apr 23, 2015

Air pollution and cardiovascular disease: Increased risk for women **...**
Nov 25, 2015

Road traffic noise linked to deaths, increased strokes: Living in an **...**
Jun 23, 2015

Number of strokes increase as **pollution** levels rise -- ScienceDaily
Feb 17, 2016

Fine particulate matter associated with slight increased mortality in **...**
Sep 8, 2015

Exposure To Fine Particle **Air Pollution** Linked With Risk Of **...**
Mar 8, 2006

Air pollution affects young people's psychiatric health
08 Jun 2016

To: The Co-Lead Agencies for the proposed MBT project at Longview, WA.

June 11, 2016

Please accept these comments into the official record for the DEIS.

Economic Analysis:

Coal has been called a dead man walking by Kevin Parker of Deutsche Bank. It's an old technology being replaced by clean, renewable energies. The Asian market for coal has collapsed. Wood MacKenzie, coal industry consultant, and a former big champion for coal exports has now recently said "building new Pacific Northwest coal ports is now viewed as nothing more than a risky long-term bet." Feb. 2016.

US coal production in the last five years has been reduced by 40% or more. Utilities are moving to cleaner and cheaper energy sources. The market cap for the four largest coal producers combined is now less than $150 million. It was $34 billion in 2011. Three of the four companies are now in bankruptcy, including Arch. Arch used to own 38% of the proposed MBT but they relinquished it to Lighthouse Resources, formerly Ambre Energy on May 26, 2016.

Brad Plumer in Vox.com earlier this year said "The U.S. coal industry is imploding." Peabody, in 2011 made a "disastrous bet on Chinese coal demand." The Chinese economy had started to slow down by then.

Daniel Gross in Slate.com says that "We're witnessing something that we rarely see in America: the sudden and sharp collapse of a functioning industry," in the past five years the value of coal companies in the Dow Jones U.S Coal Index has plummeted 93%.

Jim Levesque in Platts Coal Trader said last month that "coal dropped to 23.8% of US utility-scale power generation in March as natural gas and renewables continued to grab a greater

market share, US Energy Information Administration data shows. Renewables continue to climb closer to coal's power output."

A private equity fund called Resource Capital Funds, based in the Cayman Islands owns Lighthouse Resources. They have no history or resources to build such a major project like the proposal. It would cost about $650 million according to their own estimates. Do they have this capital to build the facility without massive public subsidies? They can't financially account for the negative impacts in the DEIS that they would have to mitigate.

In Japan, where some of this coal is projected to go, a study was done by Oxford University that shows a very high level of uncertainty for coal-fired power. Over-capacity in these markets makes for a risk of stranded assets. That can come from government policy changes as we are seeing in China or technology changes or both.

In China and Japan there is competition from renewables and nuclear energy. And since coal-fired energy is the biggest source of air pollution, carbon emissions and water pollution of all the energy types, that favors the capital market flows to renewables.

Even so-called clean coal technology is expensive and not so clean. Carbon capture technology in coal burning plants is 30-40% of the cost. It can't compete with other forms of energies according to Richard Martin in *TechnologyReview.com*.

What doesn't come out of the emission stacks ends up in the coal ash. Coal ash is well known as a very nasty toxin to humans. Where is the coal ash going to go from these coal burning plants? How well is it regulated? Does Japan have the land capacity to store coal ash? Will it be shipped to other countries that may have lax regulations? Is U.S. coal-burning and coal ash poisoning non-Americans? The DEIS doesn't even address coal burning emissions coming back to the Pacific Northwest on the jet stream full of mercury and many other toxic substances.

Bankrupt coal companies don't have to pay for cleanup of their mines. Tax payers do. The economic impacts of mined coal to burned coal are not worth the expenses of this proposal. Will MBT revenue-share with all the communities along the rail lines? Will BNSF or UP?

And what of the supposed taxes generated from the terminal if built that will benefit Washington State? Will it benefit the other states and Tribal Nations that are subject to coal and its problems rolling through their communities?

Will Longview be left with a terminal-to –nowhere as Portland and Los Angeles were in the 1990s?

In the Heavy Traffic Still Ahead (HTSA) study done in 2014 by Terry Whiteside and G. W. Fauth, who have a combined over 60 years of transportation expertise, it is stated that it's the communities along the rail routes who will pick up the tab for rail upgrades. Because the upgrades will likely need to occur in hundreds of communities and many of the upgrades will be

serious as in over and underpasses it could cost in the hundreds of millions of dollars. The upgrades figures don't include health impacts. The costs could easily be above the projected 45 million dollars or so in tax revenues.

It is extremely likely many rail communities can't afford major upgrades and won't be able to get federal Transportation Investment Generating Economic Recovery or TIGER funding.

Plus BNSF which dominates the N. route through Montana, Idaho and WA has received nearly $800 million (pg. 15 of HTSA) from the federal government through the 2009 American Recovery and Reinvestment Act for rail related projects in Washington. Yes they would improve Amtrak service but they would also "significantly help BNSF facilitate the movement of coal to the proposed PNW export terminals, and could help BNSF and the other involved companies reap billions of dollars and profits," Pg. 16 of HTSA.

In the DEIS in chapter 5 on Operations the rail traffic increases relative to capacity the Idaho/Washington State Line-Spokane says that "All Proposed Action-related BNSF trains to and from the Powder River basin would move over this segment. This segment has two main tracks with CTC. Projected 2028 capacity without improvements if 76 trains per day. The capacity concerns for this segment extend beyond Washington State to Sandpoint, Idaho. This potential constraint is identified in the Washington State Rail Plan as a key potential chokepoint.

The projected volume in 2028 is 122 trains per day, including Proposed Action-related trains. The proposed action could add 16 trains to a segment that would exceed capacity under 2028 baseline conditions. Without improvements or operating changes, Proposed Action-related trains would contribute to congestion or delays on this segment, or the inability of BNSF to handle its rail traffic. It is expected that BNSF would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted."

The above is the only mentioned specific segment of rail lines outside of Washington State in the DEIS. In the fact sheet on rail transportation: "Main line routes beyond Washington state: Without improvements, the added trains could exceed capacity for some segments."

In HTSA, page 59 the report says, "BNSF"s shortest PRB to PNW railroad route covers a distance of 1,135 miles, but the potentially impacted area is extremely broad covering a total aril distance of over 4,000 miles. These railroad routes traverse many environmentally sensitive areas, such as Glacier National Park in Montana.

Many of the impacted railroad line segments already have significant rail capacity and congestion issues associated with current rail traffic, such as PNW imports and export intermodal container traffic and grain railroad traffic. As a result of these capacity and congestion problems, there are many areas which would require major upgrading and expansion of existing railroad tracks."

Double tracking will be required in many places, the report also says, and much rail infrastructure would need to be upgraded or replaced. Double tracking is already happening in communities like Cheney. WA. Bridges are on the decline, many are old. The Federal Railroad Administration now allows officials in the U. S to report poor bridge infrastructure. I suggest the FEIS looks at anything reported in the travel area for rail for this new FRA program.

Yet BNSF and a few of their allies have testified at public meetings on the MBT proposal, that rail capacity is not a problem. It reached a height in 2006. You can't obviously look at rail capacity just in the context of coal. It has to be looked at with all types of rail traffic for capacity. We saw a bit of that in 2014 with the Surface Transportation Board's decision on getting fertilizer to market for farmers, the Cold Train lawsuit and others. Railroads make more money off of coal and oil transport and that, during part of 2014, became their priority. If grain and other modes of traffic are so important why haven't they worked on these upgrades to tracks much sooner? It's being done to facilitate more money making ventures for them since rail is a much more flexible way to get products like coal and oil to market instead of via pipelines.

In 5.1.8 of the DEIS it says, "Therefore, with existing infrastructure and using the methods to identify potential baseline rail traffic in 2018, the Proposed Action could result in a significant adverse environmental impact of rail transportation." And HTSA concludes that Although BNSF has already secured millions in federal funding to upgrade its privately-owned track in Washington state. "Local governments would likely bear the brunt and burden of related local costs and would likely be required to spend hundreds of millions of dollars in related mitigation, litigation, debt and other costs associated with the necessary improvements to accommodate export coal traffic levels."

Capacity issues will contribute to:

1. The sheer number of trains that will add more traffic to at-grade crossings for rail communities. The number of trains can produce negative impacts to businesses.
2. It will increase exposure to DPM and coal dust and thus, increase potential negative health impacts.
3. It will create more havoc for first responders and commuters.
4. It will create more noise for residents.
5. It will increase the chances for more derailments. Coal dust is a "pernicious ballast foulant" according to USDOT. It can weaken and destabilize tracks. Read the Dr. Dan Jaffe study on coal dust. The surfactants that are sprayed on it at the mine and put on again at Pasco still don't keep all the coal dust off the roads and out of fields, rivers, lakes, communities, etc. And a huge swath of rail exists between the mines and Pasco. And about 150 miles of tracks exist between Pasco and the Columbia River, which allows more time for the surfactant to wear off. Friends of the Columbia Gorge have documented coal in the Columbia River and other places. They have photos of a company, called Hulcher, hired by BNSF, vacuuming coal dust off the banks of the

Columbia River. BNSF has a new spray station at their yard in Pasco to spray coal trains, but they have sprayed coal trains since 2015 and the surfactant used still does not prevent all coal from leaving the hoppers. Neither does shaping the coal in a special position in the hopper. This has to be examined more carefully in the FEIS.

6. It's not just coal traffic, it's also traffic from oil trains to refineries and any facilities that may be built in the future, that may exceed the capacity. Plus Amtrak, grain trains, intermodal and other trains also run on these tracks. All of this traffic will increase the chance for a train derailment. It puts extra stress on tracks. Coal and Oil trains are the heaviest on the tracks. Coal trains release more diesel particulate matter than grain trains. Please see the Daniel Jaffe study from the University of Washington.
7. Global warming is likely to add to increased track stress according to a study by the University of Birmingham published in May, 2016.
8. Wildlife is barely talked about as far as rail impacts are concerned in spite of having an entire chapter on wildlife in the DEIS. Increased train traffic will negatively impact wildlife that need to cross tracks, drink or swim in water and eat food that may be contaminated with coal dust. Animals cross tracks for many reasons including migration, finding food and mating. Some herbivores will walk on tracks in the winter if the snow is very deep. And noise also negatively impacts many species of wildlife. Noise impacts are only noted for four species at the construction site when they should be considered for all wildlife outside of the study area and for the entire rail line. More trains mean more noise. These impacts to wildlife need to be considered in more detail in the FEIS.
9. The increase of CO2 from coal and other train traffic and the facilities also increases the global warming in the world. It prolongs our fossil fuel dependence which we have to get off of in order to keep our climate from getting even warmer.
10. Pedestrians and bicyclists need to be considered at railroad crossings as well. They use them and there are hundreds of rail crossings with increased traffic.

In closing, please choose the no-action alternative. We will get no action from this proposal economically because of the long term decline of coal use in the world. Those who live along the rail lines get no jobs but we pick up the tab for just a few short construction jobs, no matter how good the pay is, and no matter how good the pay is for the few permanent jobs it creates. Jobs at any costs are a very poor economic model. The rail line communities get an enormous amount of costs, with no benefit.

Please see the studies and articles linked below for further information.

Sincerely,

Laura Ackerman
Organizer and Director
The Lands Council
Spokane, WA

Final Kyoto analysis shows 100% compliance

Posted: 10 Jun 2016 06:50 AM PDT

> All 36 countries that committed to the Kyoto Protocol on climate change complied with their emission targets, according to a new scientific study.

US Counties Could Gain $1 Million in Annual Health Benefits from a Power Plant Carbon Standard

June 7, 2016

Substantial road traffic **noise** in urban areas contributes to sleep **...**
Sep 11, 2012 **...** A new study of **noise pollution** in Fulton County, Georgia, suggests that many residents are exposed to high noise levels that put them at risk of ...
https://www.sciencedaily.com/releases/2012/09/120911091353.htm

Road traffic **noise** linked to heightened risk of midriff bulge **...**
May 26, 2015 **...** Road traffic noise is linked to a heightened risk of developing a mid-riff ... They were also asked about environmental **noise pollution** from road ...
https://www.sciencedaily.com/releases/2015/05/150526085736.htm

Cities try different tactics to regulate **noise**: Survey of **noise ...**
May 23, 2016 **...** The large difference is just one example of the diversity of laws regulating noise throughout the US The **Noise Pollution** Clearinghouse, ...
https://www.sciencedaily.com/releases/2016/05/160523113726.htm

Road traffic **noise** linked to deaths, increased strokes: Living in an **...**
Jun 23, 2015 **...** Living in an area with noisy road traffic may reduce life expectancy. Research has ... A new study of **noise pollution** in ... read more. Strange & ...
https://www.sciencedaily.com/releases/2015/06/150623200112.htm

Traffic **noise** is dangerous for your health: Solutions exist for dense **...**
Jul 1, 2014 **...** Traffic **noise** is the second biggest environmental problem in the EU, according to WHO. After air **pollution**, **noise** is affecting health the most.
https://www.sciencedaily.com/releases/2014/07/140701085328.htm

Ship **noise** extends to frequencies used by endangered killer whales **...**

Feb 2, 2016 **...** One of the threats faced by today's oceans is underwater **noise pollution** from ships. Amazingly, the growth in commercial shipping has raised ...
https://www.sciencedaily.com/releases/2016/02/160202090531.htm

Negative effects of road noises on migratory birds -- ScienceDaily
Nov 6, 2013 **...** These include visual disturbances, collisions and chemical **pollution**, ... " Understanding the effects of road **noise** can help wildlife managers in ...
https://www.sciencedaily.com/releases/2013/11/131106113841.htm

Noise pollution impacts fish species differently -- ScienceDaily

Noise pollution impacts fish species differently. Date: July 24, 2014; Source: University of Bristol; Summary: Acoustic disturbance has different effects on different ...

https://www.sciencedaily.com/releases/2014/07/140724141614.htm

Air pollution and **noise pollution** increase cardiovascular risk **...**

May 20, 2013 **...** Both fine-particle air pollution and **noise pollution** may increase a person's risk of developing cardiovascular disease, according to new ...

https://www.sciencedaily.com/releases/2013/05/130520142745.htm

System for detecting **noise pollution** in the sea and its impact on **...**

Dec 16, 2010 **...** A new EU directive on the sea has ruled that all member states must comply with a set of indicators for measuring marine **noise pollution** before ...

https://www.sciencedaily.com/releases/2010/12/101216095025.htm

Noise Pollution Negatively Affects Woodland Bird Communities **...**

Jul 24, 2009 **...** A new study shows the strongest evidence yet that **noise pollution** negatively influences bird populations, findings with implications for the fate ...

https://www.sciencedaily.com/releases/2009/07/090723142050.htm

Not just for the birds: Human-made **noise** has ripple effects on plants **...**
Mar 20, 2012 **...** **Noise pollution** alters ecological services: enhanced pollination and disrupted seed dispersal. Proceedings of the Royal Society B, 2012 ...
https://www.sciencedaily.com/releases/2012/03/120320195747.htm

Noisy Roads Increase Risk Of High Blood Pressure -- ScienceDaily
Sep 11, 2009 **...** Researchers have found that people exposed to high levels of noise from nearby ... But legislation regarding **noise pollution** is ... read more ...
https://www.sciencedaily.com/releases/2009/09/090909203148.htm

Environmental Factors, Particularly Air **Pollution**, Increases Risk Of **...**
Apr 23, 2005 **...** Exposure factors that are thought to compound the risk include passive smoking, air pollution, **noise pollution** and the chemical composition of ...
https://www.sciencedaily.com/releases/2005/04/050422170441.htm

Study pumps up the volume on understanding of marine **...**
Dec 22, 2014 **...** **Noise pollution** in the ocean is increasingly recognized as harmful to marine mammals, affecting their ability to communicate, find mates, and ...
https://www.sciencedaily.com/releases/2014/12/141222131549.htm

Is **Noise** From Heavy Traffic Making You Fat? -- ScienceDaily
May 26, 2015 **...** Swiss Engineers Bring Acoustic Solution to **Noise Pollution**. Reuters (Aug. 29, 2013) — Swiss-based acoustic engineers are developing a ...
www.sciencedaily.com/.../4cd41db4522867cf5ed1fa2dadb69c6c.htm

Pollution
Noise pollution induces hearing loss, high blood pressure, stress, and sleep disturbance. Note: The above text is excerpted from the Wikipedia article " Pollution", ...
https://www.sciencedaily.com/terms/**pollution**.htm

Researchers Find Everyday Traffic **Noise** Harms The Health And **...**
May 23, 2001 **...** Even the low-level but chronic **noise** of everyday local traffic can cause ... on environmental stress, such as **noise**, crowding and air **pollution**.
https://www.sciencedaily.com/releases/2001/05/010523072445.htm

Noise distracts fish from their dinner -- ScienceDaily
Feb 28, 2011 **...** In many aquatic environments, **noise pollution** will often continue for much longer periods than the exposures used in this study, or occur ...
https://www.sciencedaily.com/releases/2011/02/110228183849.htm

Can you hear me now? Songbirds tweak their tunes in different **...**
May 30, 2011 **...** The study is part of a growing field that looks at **noise pollution** and its effects on wildlife. Honking horns, blaring sirens, and roaring machinery ...
https://www.sciencedaily.com/releases/2011/05/110526114529.htm

Negative consequences of **noise** on overall health -- ScienceDaily
Oct 29, 2013 **...** The combined toll of occupational, recreational and environmental **noise** exposure poses a serious public health threat going far beyond ...
https://www.sciencedaily.com/releases/2013/10/131029220800.htm

Planes, trains and automobiles: Traffic **noise** disturbs sleep, affects **...**
Jun 8, 2010 **...** The sound of passing trains caused the highest awakening and arousal probabilities ... But legislation regarding **noise pollution** is ... read more ...
https://www.sciencedaily.com/releases/2010/06/100608091848.htm

Chronic Illness Linked To **Coal**-mining Pollution, **Study** Shows **...**
Mar 27, 2008 **...** "Residents of **coal**-mining communities have long complained of impaired health, " and researchers say "This **study** substantiates their claims.
https://www.sciencedaily.com/releases/2008/03/080326201751.htm

Coal-tar based sealcoats on driveways, parking lots far more toxic **...**
Apr 27, 2016 **...** Of particular concern are the sealcoat products based on use of **coal** tar emulsions, experts say. **Studies** done with zebrafish -- an animal model ...
https://www.sciencedaily.com/releases/2016/04/160427151028.htm

Autism Risk Linked To Distance From Power Plants, Other Mercury **...**
Apr 25, 2008 **...** A newly published **study** of Texas school district data and industrial ... Mercury- release data examined were from 39 **coal**-fired power plants and ...
https://www.sciencedaily.com/releases/2008/04/080424120953.htm

Recent mercury pollution on the rise, but quick to change, **study** shows
Jun 29, 2015 **...** A **study** using a 600-year-old ice core shows that global mercury ... Toxic metal mercury is emitted to the atmosphere from **coal** burning, mining, ...
https://www.sciencedaily.com/releases/2015/06/150629142147.htm

Mercury levels in Hawaiian yellowfin tuna increasing -- ScienceDaily
Feb 2, 2015 **...** ... especially emissions from **coal**-fired power plants and artisanal gold mining. ... "This **study** confirms that mercury levels in open ocean fish are ...
https://www.sciencedaily.com/releases/2015/02/150202151217.htm

US electricity could be powered mostly by the sun and wind by 2030 **...**
Jan 25, 2016 **...** So MacDonald, who has **studied** weather and worked to improve ... and greenhouse gas emissions of various energy mixes, including **coal**.
https://www.sciencedaily.com/releases/2016/01/160125114231.htm

Better estimates of worldwide mercury pollution: New findings show **...**
Aug 12, 2015 **...** While its increased burning of **coal** was known to exacerbate .... Recent Mercury Pollution on the Rise, but Quick to Change, **Study** Shows.
https://www.sciencedaily.com/releases/2015/08/150812131458.htm

Mercury levels in rainfall are rising in parts of North America **...**
Jan 27, 2016 **...** ... with increased emissions of mercury from **coal**-burning power plants in Asia ... In the new **study**, researchers analyzed data from a network of ...
https://www.sciencedaily.com/releases/2016/01/160127101537.htm

Benefits associated with the reduction of mercury emissions far **...**
Feb 16, 2016 **...** But that **study** is based on an extremely small subset of the population: ... But if you consider all of the benefits of reducing **coal**-fired power plant ...
https://www.sciencedaily.com/releases/2016/02/160216152020.htm

Carbon capture analyst: '**Coal** should stay in the ground **...**
Dec 2, 2015 **...** The U-M researchers have found that most **economic** analysis of carbon capture and storage, or CCS, technology for **coal**-fired power plants ...
https://www.sciencedaily.com/releases/2015/12/151202142317.htm

Carbon reductions won't hinder Chinese growth: Professor sees **...**
Feb 9, 2016 **...** Professor sees **coal** use peaking within next decade, emissions dropping soon after ... being published by the journal Energy **Economics**.
https://www.sciencedaily.com/releases/2016/02/160209121720.htm

Global mercury regulations to have major **economic** benefits for US **...**
Jan 5, 2016 **...** The researchers calculated the projected U.S. **economic** benefits from ... to reduce mercury pollution from the country's **coal**-fired power plants.
https://www.sciencedaily.com/releases/2016/01/160105223542.htm

India Steps Back From 4 Proposed Coal-Fired Ultra Mega Power Plants

U.S. Taxpayers at Risk of Being Saddled With Coal Cleanup Bills

Data Bite: Renewables, in U.S. Government's Latest Snapshot, Are Closing In on Coal

On the Blogs: Failure of Texas Project Illustrative of Carbon-Capture Industry

BP: Record Drop in Global Coal Consumption in 2015

Philippines Government Steps Back From Coal

IEEFA Data Bite: West Australian Mine Owner Reports More Losses, Shows No Ability to Cover Clean-Up Costs

Dubai Solar-Project Bid Comes in Cheaper Than Coal

The Economy of the 'Lucky Country' Is at Risk From Its Lack of Diversification

Submission Number: ***TRANS-PASCO-M1-00060***

Received: 6/2/2016 12:00:00 AM
Commenter: Carl Adrian
Organization: Tri-City Development Council
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. Appreciate the opportunity to be here. My name is Carl Adrian. I'm president and CEO Tri-City Development Council, TRIDEC, is the lead economic development organization for Benton, Franklin Counties. We have 300 members, firms and agreements, including the four largest cities, and two counties and three local port districts to perform economic development services.

The TRIDEC Board of Directors did not pass a resolution to endorse or oppose the Millennium Bulk Terminal. Although, we did send a letter to Governor Inslee that we believe outlines several of our points that we want to get across. And at that time it addressed both Millennium and the other project that was under consideration.

There were four points in our letter. First, we believe the export of coal from Washington state will have no impact on coal consumption in the Pacific Rim. China and other Asian countries are already importing coal from Australia and elsewhere in the Pacific. Without low sulfur U.S. coal China and its neighbors will continue to use whatever is available. The net effect could be increased greenhouse gas emissions, not a reduction.

It's our firm belief that coal from the United States will be exported to the Pacific Rim, if not from Washington, then Canada. From an economic standpoint, we believe jobs and tax revenue created by Millennium should stay here in the state. This state is trade dependent. I'm sure you heard today, but let's not export jobs and tax revenue.

It's our understanding that Millennium will open the opportunity for export of other bulk commodities such as agriculture products. It may be only on a limited basis, but because much of the state is dependent on a robust agricultural economy, an increase in export capacity can only be good for farmers in Eastern Washington.

Fourth, we believe the environmental analysis required of this project creates a slippery slope for any large industrial project which may occur in the future. A "cradle to grave" approach of accessing impacts of the product as it leaves the mine, along transportation routes, and the impact of the consumed product thousands of miles away is a dangerous precedent that could just as easily be applied to an airplane factory or a Wal-Mart Distribution Center.

Finally, we are mindful of impacts to the State's transportation system as the result of increased rail traffic. More trains mean more delays at at-grade rail crossings and increased inconvenience to the motoring public as well as potential safety issues. We believe that the rail carriers involved as well as the terminal operator need to proactively work with communities along rail corridors and find ways to mitigate potential impacts.

Thank you.

TRI-CITY REGIONAL
CHAMBER OF COMMERCE

June 2, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave., Suite 550
Seattle, WA 98104

To Whom It May Concern:

On behalf of the Tri-City Regional Chamber of Commerce, I am writing today regarding the Draft Environmental Impact Statement (EIS) for the proposed Millennium Bulk Terminals in Longview, Washington and our concerns about the extensive requirements of the process.

As one of most trade-dependent states in the country, Washington is an economic leader for the Pacific Northwest. The Washington Council for International Trade estimates that 40% of all jobs in the state are related to trade and numerous Tri-Cities companies supply the world with food products and manufactured goods. To meet the demands of a 21st century economy, our state must have economic development and infrastructure projects to ensure rapidly growing communities like the Tri-Cities and Puget Sound Region can compete on a global scale. It is vital that all levels of government and the business community work together to promote a climate that makes Washington an attractive place to do business with review processes that are fair, inclusive, predictable and cost-effective to encourage growth and investment, not create more obstacles.

Over the years, our regulatory process has become longer and more uncertain, with delays often discouraging investment in Washington. In the future, we encourage state government to examine ways to reform the permitting process and make it more efficient – speeding up timelines and providing certainty to those looking to locate and expand in our community. This will drastically improve Washington's competitiveness with other states and countries, ensuring we remain an economic power for generations to come.

The Tri-City Regional Chamber looks forward to partnering with the state and other stakeholders to promote economic growth across our region. Thank you for your consideration and for the opportunity to comment on the Draft EIS process.

Sincerely,

Lori Mattson

Lori Mattson, IOM
President & CEO

7130 W. Grandridge Blvd., Suite C • Kennewick, WA 99336
(509)736-0510 • www.tricityregionalchamber.com

INSTITUTE FOR 21ST CENTURY ENERGY
U.S. CHAMBER OF COMMERCE

Karen Alderman Harbert
President and CEO

1615 H Street, NW | Washington, DC 20062
(202) 463-5558 | (202) 887-3457 Fax
www.energyxxi.org

June 13, 2016

VIA ELECTRONIC FILING

Millennium Bulk Terminals—Longview SEPA EIS
c/o ICF International
710 Second Ave, Suite 550
Seattle, WA 98104

Re: SEPA Draft EIS Public Comment

The U.S. Chamber of Commerce, the world's largest business federation representing the interests of more than three million businesses and organizations of every size, sector, and region, as well as state and local chambers and industry associations, writes to express strong support for the proposed Millennium Bulk Terminal (MBT) in Longview, and strong opposition to unprecedented conditions in the facility's draft environmental impact statement (EIS) calling for the purchase of carbon offsets in order for the project to proceed.

The importance of energy development and expanded trade opportunities to boosting lackluster U.S. economic growth is widely acknowledged. Nonetheless, our domestic policies continue to send mixed signals both to global and to U.S. markets. In particular, we are concerned about increasing regulatory restrictions that paralyze capital and threaten the fate of major U.S. infrastructure and energy projects. We need to make it clear to investors and consumers here and abroad that U.S. energy markets are open for business, and the Millennium export terminal is a perfect example of this need.

By cleaning up the site of a former Reynolds Aluminum smelter and redeveloping it into a port facility to export coal, MBT's brownfield revitalization emphasizes local environmental stewardship and would generate extensive economic benefits for state and local residents. As detailed in the draft EIS, Millennium expects the local economic benefits of the project will be substantial, generating more than $102 million in state and local tax revenue over a 30-year period and resulting in more than 2,600 direct and indirect construction jobs, as well as 300 permanent jobs (including high-paying fields such as longshoremen, which earn an average of $130,000 annually in wages and benefits).

But the project is threatened due to an unusual and unprecedented condition: the requirement that MBT account for cumulative lifecycle greenhouse gas emissions associated with the terminal, including by purchasing offset credits for up to 1.3 million tons of carbon dioxide that will be emitted annually in Asia when the exported coal is used for electricity generation.

This condition is extremely troubling for many reasons. First and foremost, it appears to represent yet another attack on American energy resources, and coal in particular. According to the Department of Energy, the U.S. already exports more than 70 million tons of coal each year from more than 30 locations across the country (including more than 4 million tons from Seattle—the 5th highest of any port). Moreover, much of this exported coal contains less sulfur and ash than other coal on the global market, making it preferable from an environmental perspective. Singling out Millennium and the port of Longview to pay fees not required of other locations is simply unfair, and puts Millennium at a significant domestic and global competitive disadvantage.

Even more concerning, however, is the precedential nature of the proposed carbon offsets. For decades, the scope of environmental permitting has rightly focused on the *site itself*, not the *product* being sold or what happens to it thousands of miles away from the facility under review. A growing push from "keep it in the ground" advocates threatens to impose global life-cycle carbon considerations into EIS reviews of all kinds—be they export facilities, pipelines, exploration and production activities, or even just roads. These requirements will often make projects economically infeasible. For example, at a carbon credit price of $20 per ton, the Millennium project's estimated 1.3 million tons of additional emissions could effectively cost port owners more than $25 million per year. That amounts to what is effectively an enormous *export tariff* on an American product.

Moreover, if this requirement is not removed, it will be used to impose similar requirements on an endless range of other exported products. The implications for other energy resources such as oil and natural gas are obvious, but it is entirely conceivable that other export products are similarly penalized, including aircraft, vehicles, heavy machinery, medical equipment, refrigerators, computers and electronic equipment, and even agricultural products. The same logic applies—use of all these products requires significant amounts of energy, and that energy increases carbon emissions. In fact, energy is so ubiquitous in trade and commerce that nearly every transaction involving overseas use of American products could theoretically become subject to global carbon offset conditions.

This is a path that would result in immeasurable harm to the U.S. economy while failing to actually reduce emissions, as activities made uneconomic by such domestic policies very

likely could move overseas (along with their emissions) to countries that do not impose similar restrictions.

For these reasons, we strongly urge the state of Washington and Cowlitz County to give careful consideration to the potential sweeping implications of proposed carbon offset requirements in the draft EIS, and approve the Millennium Bulk Terminal permit without these conditions. By pursuing sensible and balanced trade and energy policy at all levels of government, we can foster a regulatory environment that embraces trade and energy development as the economic anchor, and make it clear to the world that America is open for business.

Thank you for the opportunity to comment on this important project.

Sincerely,

Karen A. Harbert

Submission Number: ***TRANS-LV-M2-00083***

Received: 5/24/2016 12:00:00 AM
Commenter: Tim Downes
Organization: United Association Local 26, Plumbers and Pipefitters
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good evening. First of all I'd like to state my name, Tim Downes. For the record D-O-W-N-E-S. I am a business agent for plumbers and pipe fitters, Local 26. I live in Olympia, Washington. I represent about 2500 members. I do believe in the democratic process of the ESI scoping and thank you guys for doing your job and going through what you have to go through.

This process has taken long enough. The people at Millennium and those in Longview have waited more than four years to get this to the point where we're at today. The government red tape is strangling business. If any other businesses had to wait five or six years before they open their doors, I think they would move to California, Oregon, or even offshore.

We're not doing ourselves any favors, state, the city, the county by subjecting businesses to this sort of a process. I hope that we can speed up this process from here, and allow the permits to go through and we can start building this project. Everybody has waited long enough for this to happen.

Thank you.

Submission Number: ***TRANS-SPOKANE-M1-00008***

Received: 5/26/2016 12:00:00 AM
Commenter: Daren
Organization: United Transportation Division, Local 426
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hi. My name is Daren. I represent approximately 250 railroaders, United Transportation Division, Local 426. We would just like to say that we are for this project bringing much needed railroad jobs into Spokane. We represent 250 people. That was about 400 a year ago. We kind of lost a lot of business and can use this. We safely and efficiently run approximately 40 to 60 trains a day. We don't care what we're hauling. It's all about safety. The coal trains we run just as safely an any other train that runs through here. What we ship is a lower sulfur coal, which is the least harmful to ship overseas compared to the coal that they're burning now, which is very hazardous to the environment. That's all. Thanks.

Submission Number: ***TRANS-PASCO-M2-00005***

Received: 6/2/2016 12:00:00 AM
Commenter: Deken Letinich
Organization: Washington and Northern Idaho District Council of Laborers
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Deken Letinich. I'm with the Washington and Northern Idaho District Council of Laborers. We represent thousands of working men and women in the state of Washington, and we would encourage the support of the Millennium terminal.

2,650 jobs, family-wage jobs, is a great opportunity for our trade and the other trades in the state, and these aren't low-wage service industry jobs. These are good paying family-wage jobs.

It appears that the DEIS is intact and ready to go. I feel like in a place like Pasco with Hanford so nearby, I don't know how you couldn't value the family-wage jobs that energy can provide, and I hope you take that into consideration when making your decision.

Families need the jobs. This will help them. Thank you.

EVENT HOST: Thank you. Just a quick show of hands for folks that have been here, just arrived, or been here this afternoon and have a lottery ticket that are looking to speak and waiting for their number to come up.

Can we hold those hands high and we can get a quick count, Kim? If you haven't had a chance and you have a lottery ticket -- it looks like we do have -- we're going to continue with the lottery system, but we can change that if the number comes down and the return of the time spent on the lottery system diminishes.

So we'll take the next speaker. If you do have a number on the board, come forward, and we'll call ten additional numbers after this speaker.

Submission Number: ***TRANS-SPOKANE-M1-00005***

Received: 5/26/2016 12:00:00 AM
Commenter: John
Organization: Washington Farm Bureau
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. I'm John from Olympia, Washington. I'm here today representing more than 47,000 members of the Washington Farm Bureau and in support of the project that's in review. I want to highlight why we're here.

Trade is the life blood for agriculture. We're a 51 billion dollar industry, more than 164,000 jobs created to agriculture, 13 percent of the state's economy. Our life blood is trade and depends upon a world class farm to market network which includes port facilities.

We deliver the world's safest and best in food supply. To do that, we have to be able to export to whether it be to U.S. markets or to foreign markets, and it relies on a fast-moving network through the port structure.

So we're supportive of this facility not specifically because of what it would move, but because it would provide additional port capacity for us in the shipment capacity. Therefore, what we're very concerned about is as we looked at the EIS and how it would affect agriculture is, one, the boat facility. Is the ship going to carry other commodities other than just the one that has been mentioned, but we're also concerned about having a fair, predictable, responsible, regulatory system, and the precedent setting nature of this EIS including what the commodity that happens to be shipped through that facility would be used for and impacts that it might have. That's of great concern to us as we ship lots of commodities bulk, and it became a desire to not have any particular one of our food stuffs shipped. The same principle could apply. So we're concerned about having this system, the SEPA process, be responsible and predictable to allow economic movement of product through our state and to give us that ability. Thank you.

WASHINGTON PHYSICIANS FOR SOCIAL RESPONSIBILITY

May 24, 2016

Testimony on Millennium Bulk Terminals-Longview DEIS

Presented by **Laura Skelton**, Executive Director, Washington Physicians for Social Responsibility

Contact details: 4500 9th Ave. NE, Suite 92, Seattle, WA 98105 | (206) 547-2630

My name is Laura Skelton, and I'm the executive director of Washington Physicians for Social Responsibility. Our organization consists of approximately 800 medical and health professionals throughout the state.

As physicians, nurses and public health professionals, we are gravely concerned about the risks to human health and safety posed by the Millennium project. And we are not alone. In 2015, the Washington State Medical Association passed a resolution indicating their support for any legislation that would prevent or minimize potential deleterious health effects related to transporting coal by train through Washington State.

A number of alarming health and safety concerns are outlined in the DEIS.

We know that locomotives and marine vessels associated with the project will emit (Table 47) literally TONS of greenhouse gases and other air pollutants, including diesel particulate matter. Not surprisingly, inhalation cancer risks are expected to rise, especially in major population centers along the rail route.

We know that coal dust will escape from the trains, even when surfactant is applied. That coal dust is expected to raise particulate matter concentrations above the National Ambient Air Quality Standards on the BNSF main line in Cowlitz County, and to exceed (Table 6-21.

monthly maximums for coal dust deposition along the Columbia River Gorge. That coal dust contains toxins such as heavy metals and polycyclic aromatic hydrocarbons. (Table 6-22)

There are already sufficient grounds in the DEIS to select the "No Action" alternative. We encourage Department of Ecology and Cowlitz County to select the "No Action" alternative in the Final EIS, in order to protect the health of all those who call this region home.

Because this coal export project would be huge – the largest in the nation, we also urge you to complete a state-of-the-art Health Impact Assessment that includes a public review process. Such an assessment should thoroughly identify the ways in which this project could impact human health in Longview and across our region.

Thank you.

May 24, 2016

Millennium Longview Coal Terminal
DEIS Testimony

My name is Bruce Amundson. I am a physician and President of Washington Physicians for Social Responsibility. We are primarily interested in the probable health impacts.

By BNSF's own accounts, the shipment of coal in open cars is an environmentally polluting enterprise. Up to 3% of transported coal can be lost per shipment, so when massive quantities are shipped, the contamination will be, not MIGHT be, very significant. A study of a Virginia coal terminal showed that within 1 kilometer of the terminal 20% of the soil was coal dust.

There are two primary contaminants from coal transport: coal dust and diesel emissions.

First coal dust. While airborne coal dust has been documented to cause severe lung disease in coal miners, lower levels of respired dust, within legal limits, have also been shown to cause lung disease. This is especially the case for children. Coal dust can also aggravate existing lung diseases such as asthma.

The second major pollutant is diesel exhaust. The pollutants of greatest concern are particles of tiny size, 2.5 microns or less, because they are small enough to be carried deep into lung tissue. And diesel engines produce these at a rate 20 times greater than gasoline engines.

Diesel emissions have been implicated in a number of diseases involving lungs heart and brain.

The research findings are not subtle. Moderate increases in levels of PM 2.5 have been shown to increase substantially both pulmonary and cardiovascular death rates. A 2009 study showed that even living close to a major highway was strongly associated with left heart hypertrophy, an important cause of heart failure.

In summary, diesel exhaust and coal dust are toxic to human health, and thousands of people will live and work in close proximity to the trains and terminal.

We strongly oppose the plan to construct the Millennium Bulk Terminal due to serious risks to human health.

At the very least we insist that a Health Impact Assessment be included in the EIS. A proposal of this immense magnitude must include a thorough assessment of the serious health risks. Social justice and public health protection demand it.

Bruce Amundson, MD
President
Washington Physicians for Social Responsibility
4500-9th Ave NE, Suite 92
Seattle WA 98105

May 18, 2016

Jill Mangaliman, Got Green
Rich Stolz, OneAmerica
Tony Lee, Asian Pacific Islander Coalition
Mauricio Ayon, Washington CAN
Peter Bloch Garcia, Latino Community Fund
Rebecca Saldaña, Puget Sound Sage
Aiko Schaefer, Front & Centered
Rosalinda Guillen, Community to Community Development
Sarah Clifthorne, Washington Federation of State Employees
Sarah Cherin, UFCW21
Adam Glickman, SEIU 775
Jeff Johnson, WSLC/AFL-CIO

Dear Alliance Colleagues,

Thank you for the letter you sent in March, requesting us to formally take a position in opposition to I-732.

After careful consideration of the initiative, our organization has decided to remain neutral on I-732 at this time.

We at WPSR deeply appreciate your work in the Alliance and respect your decision to formally oppose I-732. Like you, we are committed to developing a carbon pricing policy that is just and equitable. We agree that it is imperative to build a movement that includes all who call Washington home.

Our organization is proud to be part of the Alliance with you and to support the Alliance's work to address one of the world's most urgent threats to human health and safety.

Sincerely,

Bruce Amundson, M.D.
President

Submission Number: ***TRANS-LV-M1-00041***

Received: 5/24/2016 12:00:00 AM
Commenter: Bruce
Organization: Washington Physicians for Social Responsibility
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

My name is Bruce (inaudible). I'm from Shoreline, Washington. I'm a family physician. I'm the president of Washington Physicians for Social Responsibility. By Burlington Northern's own account, the shipping of coal in open cars is an environmentally polluting enterprise. Up to three percent of transported coal could be lost per shipment, so when massive quantities are shipped, the contamination will be not likely very significant. The study of a Virginia coal terminal showed that within one kilometer of the terminal 20 percent of the soil was coal dust. There are two primary contaminants from coal transport: Coal dust and diesel emission. First coal dust. Coal dust has been documented to cause severe lung disease to coal miners, lower levels of this gases within legal limits have also been shown to cause lung disease. This is especially the cause for children and can aggravate existing lung such as asthma. The second major pollutant is diesel exhaust. The pollutants of greatest concern are particles of tiny size. 2.5 microns or less. Because they are small enough to be carried deep into lung tissue. And diesel engines produce these at a rate 20 times greater than gasoline engines. Diesel emissions will also create a number of diseases involving lung, heart, and brain. The research findings are not subtle. Neither are the increases in levels of (inaudible) and have shown an increase substantially in both pulmonary and cardiovascular deference. The 2009 studies show that even living close to a major highway were strongly associated with left hypertrophy, or cause of death. In summary, diesel exhaust and coal dust are toxic to human health and thousands of people live and work in close proximity. We strongly oppose the plan to construct the terminal due to (inaudible) human health. At the very least we insist that a health impact assessment be included in the EIS. (Inaudible) with immense magnitude must include a thorough assessment of serious health risks. Social justice and public health protection demanded. Thank you.

Submission Number: ***TRANS-LV-M2-00059***

Received: 5/24/2016 12:00:00 AM
Commenter: Lora Skeleton
Organization: Washington Physicians for Social Responsibility, Executive Director
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hello, my name is Lora Skeleton (phonetic). I'm the executive director of Washington Physicians for Social Responsibility. Our organization consists of 800 medical professionals throughout the state. As physicians, nurses, and public health professionals, we are gravely concerned about the risk to human health and safety proposed by the Millennium project.

And we are not alone. Last year the Washington State Medical Association passed a resolution indicating their support for any legislation that would prevent or minimize essential to the serious health effects related to the transport of coal by train through Washington state.

A number of alarming safety and health concerns are outlined in the project DEIS. We know that locomotive and marine vessels associated with the project will emit tons of greenhouse gases and other air pollutants including particulate matter. Inhalation and cancer risks are expected to rise especially in major population centers along the rail route.

We know that coal dust will escape from trains even when surfactant is applied. Coal dust is expected to raise particulate matter concentrations above buffer the national ambient air standards on the BNSF mainline in Cowlitz County. And also to exceed monthly maximum for coal dust deposition along the Columbia River Gorge.

That coal dust contains toxins such as heavy metals and polycyclic aromatic hydrocarbon. There are already sufficient grounds in the grounds to select the no action alternative. We encourage Department of Ecology and Cowlitz to select the no action alternative in the final EIS.

In order to protect the health of all those who call this region home. And because this coal export project would be huge, the largest in the nation, we urge you to complete a state of the art health impact assessment that includes a public review process.

Such an assessment should identify the ways in which this project could impact human health in Longview and across our region.

Thank you.

Submission Number: ***TRANS-PASCO-M1-00029***

Received: 6/2/2016 12:00:00 AM
Commenter: Sara Cate
Organization: Washington Physicians for Social Responsibility
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Hello, my name is Sara Cate. I'm a family physician here in this region, and I have a background in public health and environmental epidemiology. And I have spent several years looking up health effects from the Hanford Nuclear Reservation on the communities in this area. I have lived and worked and raised a family in this region. And I'm here for -- as a representative of the Washington Physicians for Social Responsibility. I'm also here as an advocate for the families and communities who will bear the disease burden of any kind of health effects from the coal trains.

Our biggest concern is that 44 million tons of coal will be transported by a lot of trains through this region. And that they will have some significant pollution effects. The things that we're most concerned about is the diesel. Diesel is burned when we have all these trains running through the area. And diesel is associated with an increase in particulates. Particulates cause respiratory illness, and long term have increased risk of lung cancer and bladder cancer.

So as a physician, when I present a medical intervention to a patient, I will talk about the risks and benefits of that medical intervention and then I will ask the patient to make an informed decision. And that's what we want to happen here. We feel there is a moral, ethical consideration that communities should know what the health impacts of what the coal trains will be and that they will be able to make an informed decision about that. So I'm really focusing on the health impacts of the pollution. To this end, we request that the --

EVENT HOST: Next speaker. You can leave the written statement. Thank you.

June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

To Whom It May Concern:

On behalf of our membership, I am writing to comment on the Draft Environmental Impact Statement (DEIS) for the Millennium Bulk Terminals project currently under review. Thank you for considering our perspective.

It is important to state from the outset that neither WPPA nor any of our individual members has any position on the Millennium proposal. Our interest is limited entirely to the current administration of the state's environmental review law. As frequent SEPA lead agencies, port districts have a vested interest in the appropriate, consistent administration of this important law. Ports take a long view when evaluating changes to Washington's environmental review law that is not bound in any way to the Millennium project itself.

Washington's State Environmental Policy Act (SEPA, RCW 43.21C) is intended to evaluate the environmental effects associated with both public and private development actions in our state. SEPA is informational tool to be used to identify alternative actions and/or mitigation for project-driven consequences. As administered since enactment, this law has been understood to be limited to assessing environmental impacts occurring within the State of Washington. It is commonly understood that project-related impacts outside the state's regulatory authority are not evaluated.

These foundational understandings are challenged by the Millennium DEIS.

Washington Public Ports Association

A Trade Association Representing the 75 Public Port Districts of Washington State

1501 Capitol Way, Suite 304 ● Olympia, WA 98501 ● 360.943.0760 ● 360.753.6176 FAX ● www.washingtonports.org

The DEIS sets a precedent by attempting to evaluate the effect the project will have on overall transportation infrastructure and throughways. While it is not unusual to evaluate a project for its transportation impacts, the Millennium DEIS adds no value in the way it examines this question. Under federal law, common carriers are required to provide service to all customers. How they accomplish this task is up to the utilities themselves. This is as much the case for BNSF as it is for Puget Sound Energy, or a wireless provider. The DEIS adds no value by evaluating an impact outside the state's power to address.

The same reasoning holds for the DEIS analysis of vessel traffic on the Columbia River. A dynamic system will respond to increasing transits to safely accommodate new levels of activity. In any case, management of the system or allocation of capacity lies outside Washington's authority to regulate. As a matter of practice, impacts that lie outside of the state's power to regulate have historically been forestalled from consideration in Washington.

The DEIS sets a second inappropriate precedent in proposed mitigation for greenhouse gases. Without statutory guidance of any kind, the Department of Ecology arbitrarily asserts that the proponent will mitigate for one half of life-cycle carbon dioxide emissions accruing to coal passing through the facility. WPPA is deeply concerned by the notion that a permittee can be administratively compelled to mitigate for impacts in the absence of clear policy guidance from the legislature.

As a matter of law, ports believe that the legislature is the only proper source of a policy with such far reaching consequences. The assertions of agency policy-makers notwithstanding, the people of Washington can have no confidence that this new policy will not be applied to future projects.

Our members provide logistical services for a wide range of products manufactured or grown both inside and outside of Washington. What confidence can ports and our customers maintain that facilities related to importing automobiles, or shipping grain, or exporting aircraft will not be required to meet the fifty percent life-cycle carbon mitigation standard? Where in state law is this made clear?

Whether the Millennium Bulk Terminal is permitted and operated successfully is not our concern. WPPA and our members are troubled that the Department of Ecology has expanded the reach of the state's environmental review by requiring mitigation for impacts outside of the state's jurisdiction, and have created a mitigation standard for carbon dioxide that is not supported by legislative policy.

Thank you for considering our comments.

Sincerely,

Eric D. Johnson
Executive Director

Submission Number: ***TRANS-SPOKANE-M1-00006***

Received: 5/26/2016 12:00:00 AM
Commenter: Mark Martinez
Organization: Washington State Building and Construction Trade Council
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
Thank you for the opportunity to speak. For the record, my name is Mark Martinez. I live in Tacoma, Washington. I also have the honor of being the president of the Washington State Building and Construction Trade Council representing 70,000 construction workers who live in the beautiful state of Washington.

My brothers and sisters are your neighbors that build the roads, the schools, the office buildings that we all use every day. The proposed investment of hundreds of millions of dollars for the export facility in Longview is a needed boost to my members in Southwest Washington. Tens of millions of tax revenue during construction and millions of dollars in local taxes during operations would be used for community needs.

The developer is not just building a new facility. They are cleaning up a long-term brown field, recycling and/or removing 300,000 tons of material from the site. They're doing the right thing for the community.

Make no mistake, our members welcome a transition to a power generation economy that reduces dependence on fossil fuels because we're the folks that actually build the wind turbines and we wire the power for the solar panels, so we're already doing that work.

We also understand that this transition is happening. It's going to need fossil fuels into the future because they're going to be in demand around the world to produce the wind turbines and the solar cells that we're going to need.

The Washington State Building and Construction Trade Council and its 70,000 members support the Millennium Bulk Terminals Longview project. We believe the Draft EIS is as thorough and complete as possible. It is now time to move onto the final EIS, approve the permits and put thousands of people to work. Thank you.

Submission Number: ***TRANS-LV-M2-00032***

Received: 5/24/2016 12:00:00 AM
Commenter: Mark Martinez
Organization: Washington State Building and Construction Trades Council
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
SPEAKER 28: Thank you for the opportunity to speak. For the record, my name is Mark Martinez (phonetic). I live in Tacoma, Washington. I also have the privilege of being the president of the Pierce -- of the Washington State Building and Construction Trades Council, representing 70,000 construction workers who live and work in our beautiful state.

My brothers and sisters are the folks, and your neighbors, that build the roads, the schools, the hospitals, and the office buildings that we use every day. The investment of tens of hundreds of millions of dollars in this export facility is a needed boost to many members that live in southwest Washington.

Tens of millions of dollars in tax revenues during construction and millions in local taxes during the operations will be used for the community needs here in Longview in Cowlitz County. And a developer just -- isn't just building a brand-new facility. They're cleaning up a long time Browns Field, moving 300,000 tons of waste from the site. They're doing the right thing for the community.

Washington State Building Construction Trades Council and the 70,000 members supports the Millennium Bulk Terminal project. We believe the Draft EIS is as complete and thorough as possible. It is time to move on to the final EIS, approve the permits, and put thousands of people to work.

Thank you.

Submission Number: ***TRANS-LV-M2-00012***

Received: 5/24/2016 12:00:00 AM
Commenter: Lee Nugent
Organization: Washington State Building Trades , Executive Secretary
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text

Good evening. Thank you for taking testimony. My name is Lee Nugent (phonetic), and I'm the executive secretary of the Washington State Building Trades who represent 70,000 craft workers in Washington state, 4,000 here in Kelso/Longview.

First thing we want to make clear for the building trades is that we're not arguing against all of our friends in the red shirts in the audience today. We're not climate deniers, but we do understand that our economy is tied to fossil fuels. We need to have a timeline and a timeline to get -- diversify ourselves from that dependency, but we're not there now.

We also know we need these jobs. We know that in this community they have been impacted by the pulp mills closing down, and the paper mills closing down, and the logging is going away and there's no jobs to take their place.

When Millennium came here -- four years they've been going through this process. This is an over $2 billion privately funded project. And it's time for us to move forward. We have full confidence that the EIS will go forward and we will have a valid project at the end.

We also want to comment, that, you know, for our elected officials it's time to step up. It's a privately funded project, over $2 billion worth. There is no alternative. Nobody voting no or nobody coming against this project has promoted any project or funded any project to take its place. The land in question is industrial lands already. Millennium has been spending the last four years cleaning up the project so that they could proceed forward. I'm confident with them moving forward and encourage a yes vote.

Thank you very much.

Submission Number: ***TRANS-SPOKANE-M1-00007***

Received: 5/26/2016 12:00:00 AM
Commenter: Mike Elliott
Organization: Washington State Legislative Board, Brother of the Local of Engineers and Trainmen
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Mike Elliott. I was raised here in Spokane. I'm a graduate of both Shadle Park High School and Eastern Washington University.

I'm here today on behalf of the Washington State Legislative Board, brother of the Local of Engineers and Trainmen. We represent over 900 members statewide. Our state board was established in 1904 and our labor union has a documented presence in Washington State dating back to 1884.

We fully support the Millennium Bulk Terminal for Longview, Washington. It's a vital private investment in jobs, community, commerce, and trade infrastructure important to Washington State and our neighboring states.

Over four years ago, Millennium began the process to build a modern state of the art bulk commodities export terminal within an existing industrial corridor and on a former aluminum smelting site.

Millennium has cleaned up the smelting site, recycled all they could, and demonstrated they're a responsible operator, community partner, and employer.

The Draft Environmental Impact Statement that was examined -- that has examined nearly every conceivable aspect of the proposal including rail routes, commodities, and use is unprecedented.

The NEPA/SEPA process must be fair, balanced, and timely for all applicants regardless of the commodity.

Therefore, we respectfully request the EIS process be allowed to proceed without further delay. Having hauled every commodity on Earth for over 153 years, we know the importance of work, job, commerce, and infrastructure.

Millennium is the best thing in all of these and should be issued the necessary permits to complete the project. Thank you.

Submission Number: ***TRANS-LV-M2-00039***

Received: 5/24/2016 12:00:00 AM
Commenter: Mike Elliott
Organization: Washington State Legislative Board, Brothers of the Locomotive and Engineers and Trainmen
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

Good afternoon. My name is Mike Elliott (phonetic). I reside in Tacoma, Washington. Thank you for the opportunity to comment on the proposed Millennium Bulk Terminal. I'm here today on behalf of the Washington State Legislative Board, Brothers of the Locomotive and Engineers and Trainmen, and we represent 900 locomotive and engineers and trainmen across Washington state.

Our state board was established in 1804 and our labor union has a documented presence here in Washington state since 1884. We fully support the Millennium Bulk Terminal project. It's a vital, private investment in jobs, the community, and in trade infrastructure important to Washington state and in neighboring states.

Cowlitz County has been an established industrial corridor for many decades and should welcome the opportunity for a modern seaport terminal. Over four years ago Millennium began the permitting process assist for building a modern state of the art bulk terminal.

The thorough examination of every conceivable aspect of this proposal, as well as the commodity route and end use, is unprecedented. Therefore we respectfully request the EIS process be allowed to proceed without further delay.

Millennium has cleaned up a former smelting site, recycled all they could and demonstrated they're a responsible operator, community partner and employer. Having hauled every commodity on earth for over 153 years, we know the importance of work, jobs, commerce and infrastructure. Millennium is investing in all of these and should be issued the permits to complete the project.

Thank you.

WORC

Western Organization of Resource Councils

13 June 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

[Submitted electronically]

SEPA Draft Environmental Impact Statement comments

The Western Organization of Resource Councils (WORC) is a seven-state network of community based organizations that support responsible energy development, family farms and ranches and homegrown prosperity. WORC joins in the comprehensive comments prepared and submitted by Northern Plains Resource Council, our Montana based affiliate. In addition, we offer the following resources as references to deepen the understanding of the effects of issuing a permit for the port, particularly the effects that will result outside the State of Washington. These are concerns that were, for the most part, not addressed in the MBT Draft Environmental Impact Statement. In particular, the additional mining of 48.5 million short tons of coal that would supply the terminal and the effects of that rail haul on communities along the route between the mines and the port receives very little attention in the DEIS.

We also wish to register concern for the lack of serious economic analysis of capacity issues on the rail lines serving the proposed port and the consequences to other shippers that result from the addition of 18 trains per day if the proposed port is constructed.

Rail Traffic

WORC has invested in and prepared a detailed analysis of the routes and the volume of trains to carry 48.5 million short tons of coal from the Powder River Basin to the MBT. In 2012, WORC published ***Heavy Traffic Ahead***, (http://www.heavytrafficahead.org/pdf/Heavy-Traffic-Ahead-web.pdf), subtitled, Rail Impacts of Powder River Basin Coal to Asia by way of Pacific Northwest Terminals. The report was prepared by well credentialed, qualified professionals with over 30 years each in overseeing railroads, shipping, and/or representing rail commodity producers in their dealings with railroads. The report found that agricultural shippers would likely experience delays and increases in costs as the rail lines in the region are already struggling at or near capacity. Additionally, it identified the costly issue of infrastructure

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needed to address traffic and community impacts of vastly increased rail traffic along the routes between the coal mines and the ports being proposed – all the way from Wyoming and Montana.

In 2014, our report was updated with the publication of ***Heavy Traffic Still Ahead***, http://www.heavytrafficahead.org/pdf/Heavy-Traffic-Still-Ahead-web.pdf

Heavy Traffic Still Ahead updated the earlier 2012 report, ***Heavy Traffic Ahead,*** and reevaluated the anticipated increase in coal train traffic in light of changing plans for ports in the Pacific Northwest. In addition, the update discussed the combined effects of oil trains traveling from North Dakota over the same routes. It also identified impacts to communities along the route, consequences for existing rail users, including agricultural shippers and passenger service, and how coal export could affect rail corridors already near capacity.

The report identified several issues most of which are not covered by the Draft EIS for MBT. They include:

- A major bottleneck is BNSF's 70.5-mile line between Sandpoint, ID, and Spokane, WA, which already has serious capacity issues and would feel the full potential impact of added BNSF PRB to PNW export coal trains. In addition, this line could see the addition of 22 trains per day of loaded and empty Bakken oil trains moving to the PNW.

- The 24.8 mile stretch between Huntley, MT, and Mossmain, MT (which traverses Montana's largest city, Billings) also represents a major bottleneck. Currently, this line handles approximately 18 to 22 trains per day. Total rail traffic through Billings could more than triple in a decade, depending on whether proposed export terminals are built in the Washington, or expanded in Canada.

- A variety of railroad freight shippers would likely be adversely impacted by tightened rail capacity if the export coal terminals are built. Intermodal container traffic and export grain traffic could experience higher freight rates, deteriorating service and higher equipment costs.

- Passenger and commuter rail traffic, including Amtrak's Empire Builder, which travels through the highly congested "Funnel" between Sand Point and Spokane, would likely be disrupted by increased rail congestion caused by an increase in export coal trains.

Local community infrastructure expenditures that could be triggered by large increases in rail traffic would cost taxpayers hundreds of millions, if not billions. Some (by no means all) of the identified potential mitigation projects include:

- Sheridan, Wyoming: $156 - $169 million
- Billings , Montana: $18 - $150 million
- Livingston, MT: $8.7 million
- Helena, MT: $13 million
- Spokane, WA: $71.6 million
- Seattle, WA: $100 million
- Edmonds, WA: $80 million
- Marysville, WA: $92 million
- Mt. Vernon, WA: $40 million
- Burlington, WA: $40 million

The two reports were prepared by Terry Whiteside and G.W. Fauth. Terry Whiteside is principal in Whiteside and Associates, a transportation and marketing consulting firm. He has over 30 years' experience in transportation with both carrier and shipper representations. He represents most of the wheat and barley commissions throughout the Western half of the U.S, including the Montana Wheat and Barley Commission. G.W. Fauth is a recognized expert in transportation issues with 30 years' experience, including the Surface Transportation Board where he served as staff advisor on transportation issues to one of the Commissioners. His experience includes economic, regulatory, public policy and legislative issues primarily associated with, or related to, the U.S. railroad industry.

Coal Mine Reclamation

Coal mines in the Powder River Basin are expected to supply coal for the Millennium Bulk Terminal. In June 2015, WORC produced an analysis of the growing gap between mined land disturbed and mined land reclaimed to meet the standards of federal and state law. That report can be found at **Undermined Promise II**, http://www.underminedpromise.org/. It found that after nearly 40 years of operating under the reformed federal strip mine law of 1977, designed to ensure reclamation success, mines in the Powder River Basin are not measuring up.

Key findings include:

- After decades of mining across 450 square miles of disturbed mined land in Montana, North Dakota, and Wyoming, only 46 square miles has met the reclamation requirements for final phase III and IV bond release. This calls into question the industry's prospects of successfully reclaiming the harsh, brittle and semi-arid ecosystems of Western states.

- The gap between acres of land disturbed by mining and acres released from reclamation bond continues to grow, and with it the outstanding bond liabilities

of coal companies mount. The largest mines have bonds in excess of $300,000,000 apiece.

- Some states allow larger coal companies to "self-bond" their mining reclamation obligations rather than collateralize them with financial assurance instruments. In the year since the report identified the concern of self bonds, Alpha Natural Resources, Arch Coal, and Peabody, three of the largest producers in the Powder River Basin, have declared bankruptcy, calling into question their ability to fulfill reclamation requirements. The nearly $2 billion burden of mine reclamation covered by self bonds in Wyoming could be left to U.S. and local taxpayers.

- Water is perhaps the most precious natural resource in the West and protection of the hydrologic balance is a principle goal of SMCRA, yet *Undermined Promise II* finds that mine permits too often fail to adequately capture essential data to fully assess the baseline hydrologic balance. Water resources cannot be protected during mining or afterward without this data.

- Protecting and restoring wildlife habitat to its pre-mining integrity is also a principle goal, yet SMCRA's performance standards are not resulting in quality habitats. Lands claimed to be reclaimed by coal operators appear aesthetically pleasing, yet plant communities essential for wildlife are significantly non-diverse and non-native.

- Reclamation in the fragile sage steppe environment of the West that is home to the threatened sage grouse and hundreds of other wildlife species may take decades of natural development to reestablish the characteristics of native shrub communities comparable to pre-mining conditions.

For all of these reasons, which are not addressed by the DEIS, WORC encourages the State of Washington to deny the permits for the proposed Millennium Bulk Terminal at Longview.

Respectfully Submitted,

Nancy Hartenhoff-Crooks, Chair

Submission Number: ***MBTL-SEPA-DEIS-0003352***

Received: 6/13/2016 9:28:57 PM
Commenter: Donald Collins
Organization: Western Research Institute
State: Wyoming

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

It is important to note that the Department of Energy (DOE) 2015 Annual Energy Outlook (AEO2015) used for the SEPA Draft Environmental Impact Statement (DEIS) does not include the greenhouse gas emission reductions and climate change benefits for deploying carbon capture utilization and storage (CCUS) technologies on coal power plants likely to use coal exported from the Proposed Action. Likewise, AEO2015 analyses do not include CCUS technology benefits within the United States. In addition, the DOE 2016 International Energy Outlook (IEO2016) also does not include the greenhouse gas emission reductions and climate change benefits for deploying CCUS technologies on coal power plants likely to use coal exports from the Proposed Action. This important omission in the DOE AEO2015 and IEO2016 results in the DOE overstating the global annual greenhouse gas emissions during the operational time period for the Proposed Action. Furthermore, use of the DOE AEO2015 for the SEPA DEIS also results in overstating the likely greenhouse gas emissions and climate change impacts for the Proposed Action, and therefore incorrectly finds that the Proposed Action constitutes an “Unavoidable and Significant Adverse Environmental Impact”.

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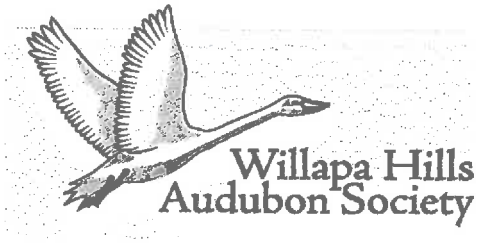

P.O. Box 399
Longview, WA 98626

June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International,
710 Second Avenue, Suite 550
Seattle, WA 98104

Re: Draft Environmental Impact Statement for proposed Millennium Bulk Terminals in Longview, WA

Dear sirs:

Thank you for the opportunity to comment on this project on behalf of Willapa Hills Audubon Society and ten other Washington chapters of the National Audubon Society which have signed onto this letter. Part of Audubon's mission is to protect habitat for all inhabitants of our ecosystem, both wildlife and humans. Willapa Hills Audubon Society's region is in Southwest Washington along both banks of the Columbia River, and includes Cowlitz, Wahkiakum, and Pacific Counties in Washington, and Columbia County in Oregon. Most of our chapter's 200 members live in Longview. Of the 25 Audubon chapters in Washington state, our chapter's region and membership is most directly affected by Millennium's proposed coal export terminal, so we are the lead chapter to research and write comments on the Draft Environmental Impact Statement (DEIS).

One element that is clearly missing from the DEIS is the Health Impact Assessment agreed upon in June 2015. Until that assessment is complete, no final Environmental Impact Statement (EIS) should be published. As mentioned below, the Health Impact Assessment should include new studies that will bring clear evidence of the health effects of coal dust on residents not working directly with coal.

At the DEIS hearing on May 24, 2016, in Longview, WA, Department of Ecology (DOE) officials stated that further studies may be undertaken before a Final EIS is published. We ask that third-party studies or DOE-sponsored studies be completed in six areas:

- effects of coal dust on residents, not coal-industry employees, exposed to coal dust;
- effects of coal dust on birds;

- effects of coal dust and spilled coal on fish and other marine fauna, especially listed species in the Columbia River;
- effects of fish stranding for beaches downstream of Barlow Point for the vast increase in Panamax and Hanamax vessels which cause high wakes;
- the amounts of coal dust emitted by the coal trains at different parts of the BNSF route from the PRB mines to Longview, related to the effectiveness of the loaf-shaped coal loads and coal-suppression spray procedures proposed by BSNF;
- the effectiveness of covers for coal train cars in reducing dusting along the train routes.

DOE has a duty to apply the best available science in its decisions—when science is lacking, DOE should not give the "go-ahead" to this project.

Additional studies should produce clear answers about how dangerous coal dust is to humans and wildlife and how effective loaf-shaped coal loading, surfactant spraying, and closed coal cars might be in reducing coal dusting from trains. In turn this would produce informed decisions about mitigating for these effects or even denying permits for the project.

However, even if these studies result in evidence for minimal harm for humans or wildlife, we explain below many other concerns about the DEIS, especially in the areas of analysis and mitigation. **Because of these inadequacies, we request that the Department of Ecology take the "No Action" alternative for this proposal.**

TRAIN –RELATED EFFECTS ON HUMAN HEALTH

- **Noise from construction and operations at the project site –**

The DEIS states that Millennium will monitor two residences nearest the project for noise exceeding acceptable levels and will modify operations or building insulation if necessary. These measures are vague and should be specified in the final EIS.

- **Noise from trains –**

Noise from trains and traffic has been shown to contribute to adverse health effects, including cardiovascular disease (Mead 2007). The DEIS finds no significant and adverse effect for noise levels for residents living near the project site.

On the other hand, the DEIS states that noise levels at rail crossings in three Longview neighborhoods will be elevated due to increased horn noise coming from an additional 16 train units transiting per day—at 100 feet, trains have a decibel level of 92 - 110 and can be highly aggravating to community members up to 600 - 1,000 feet (Horn Noise). The DEIS states that Millennium will help create and fund a "Quiet Zone 3" or other measures along the Reynolds Lead. However, Millennium has not applied for a noise permit, so this commitment is not enforceable. The DEIS should require a noise permit from the BSNF for the increase in aggravating train horn noise from 16 additional trains blowing their horns each day.

Furthermore, noise permits and mitigation should extend beyond the three Longview neighborhoods. These should be required for all rail crossings which require train horn blowing on the BSNF main line, and not just in Washington State. This mitigation should extend from the Powder River Basin mines to the new terminal.

- **Coal Dust from trains and operations in Cowlitz County --**

"While the average and maximum deposition of coal dust on the BNSF main line in Cowlitz County was estimated to be above the nuisance thresholds at 50 and 100 feet, respectively, no state or federal standards apply, and this would be an unavoidable but not significant impact." Since there are no federal or state standards for this kind of pollution, no mitigation is proposed in the DEIS. Dirty coal dust may not be a direct health hazard, but it certainly negatively contributes to aesthetics and enjoyment of one's home. For residents living near Prince Rupert coal terminal in Canada, the coal terminal company washes down the houses and outside structures (De Page 2011). Our residents should have at least the same service if they complain about coal dust. According to the project map in the DEIS, only one small residential area along the Reynolds railroad spur would be affected, so rectifying this problem would not be a big expense if coal dust will only affect residents at the distances that the DEIS claims. On the other hand, residents one mile from the McDuffie coal terminal in Mobile, Alabama, complain about coal dust deposits on their homes (Weis, Barraza, and Brantley 2016). If it turns out that coal dust is carried further than 100 feet, then Millennium will have more dust to wash off.

Moreover, coal dust may be more than just a nuisance. Coal dust for non-occupational exposure is not regulated at the state and federal levels, but it is well-accepted coal dust is harmful to human health for workers in the coal industry. For example, exposure to coal dust has been linked to increases in chronic bronchitis, emphysema, asthma, COPD, and black lung disease in miners (Coal Mine Dust 2011). Research on the health effects of non-occupational exposure to coal is minimal so that the correlation between non-occupational exposure to coal and cancer or respiratory illness remains inconclusive (Jenkins et al. 2013, Learn 2013). Some additional research on the human health effects of living in close proximity to coal operations is being done. For instance, a 2013 study showed increases in digestive and other cancers, depending on the proximity of the city of residence to Spanish coal mines (Fernandez-Navarro, et.al. 2013). We call on the DOE to fund studies of residents in other parts of the United States who live in areas with coal dust to see whether there are negative effects on their health. If coal dust is found to be detrimental to the health of residents exposed to this pollutant, the Final EIS should recommend regulation at the state level and withhold permits until this regulation is in place.

- **Particulate matter pollution along railroad tracks outside Cowlitz County –**

The DEIS states that there will be no adverse and significant effects from the Millennium project in terms of coal dust pollution along the tracks. The BSNF railroad claims that 85% of coal dust from open coal cars will be reduced by shaping the load into a brick and spraying each load with surfactants. Trains from the Powder River Basin in Montana and Wyoming will be sprayed when they are loaded there and again in Pasco as they enter the state of Washington. However, these claims that the dust from coal trains will be significantly reduced are based only on the industry's internal studies. The Final EIS should not be issued until third-party studies confirm that the

particulate matter from coal trains will indeed be reduced substantially by the mitigation measures and that they will be sufficient to reduce hazards to human health.

We also request that studies be completed on covers for rail cars loaded with coal since at least five have been developed (Gambrel 2013). The effectiveness of these covers should be measured against the effectiveness of the current system required by the BSNF railroad for cars loaded with coal, i.e., loading the coal in a loaf shape and spraying loaded cars with surfactants. People living and working along the tracks deserve the best possible protection from toxics contained in the coal, whether this protection be from surfactants, rail car covers, or a combination of both.

In addition, some coal for the terminal will come from Utah and the Powder River Basin by the Union Pacific rail line – the DEIS states that the rail companies will work out what measures will be taken to prevent coal dust deposition from those mines. This is too vague – the final EIS must specify what steps will be taken and how they will be monitored and enforced. While outside the jurisdiction of Washington, the DOE should not issue a permit until other states affected by increased coal transport carry out their own EIS processes, or mitigation measures for all states are listed in the U.S. Corps of Engineers NEPA review.

- **Train crossing delays –**

The DEIS states "In a 24-hour period, trains for the Proposed Action would increase the probability of emergency response vehicles being delayed by 10% at crossings along the Reynolds Lead and BNSF Spur with existing track infrastructure" (p. S-32). With planned improvements to these two lines, the probability of delay decreases considerably. However, for train crossings outside of Cowlitz County, there are no planned improvements, despite "the probability of an increase in emergency response time at all statewide study crossings [due to more frequent blockage by train cars]" (p. S-32). Our emergency response departments pride themselves on reducing response time for a reason—quick responses can mean the difference between minor and severe damages, and even life and death. On page 5.1.23, the DEIS states "BNSF could address capacity issues with capital improvements or operational changes, but it is unknown when these actions would be taken or permitted." The DEIS states that the train crossing delays are an unavoidable adverse effect, but no mitigation is proposed. Instead, DOE should negotiate agreements with the railroads to lock in the needed upgrades to crossings. In addition, Millennium should be required to mitigate for injuries, deaths, and property destruction caused by emergency vehicle delays at crossings.

- **Train accidents –**

The DEIS model predicts that by itself the Millennium project will increase train accidents in Cowlitz County by .46 per year for loaded coal trains and .5 per year for empty trains—about one accident every two years for loaded and unloaded trains in Cowlitz County. This number of accidents would be increased without promised improvements by the Longview Switching Company for the BSNF Spur and Reynolds Lead. Outside these railroad lines, the DEIS states that the Millennium project alone would increase the number of accidents on train lines within Washington State by 5.16 per year of loaded car trains and 6.23 per year of empty trains. However, the cumulative effects of adding the Millennium project to expected baseline rail

traffic will be an increase of 11.38 accidents per year in Washington State. The DEIS acknowledges that this is a high level of increase in accidents and these are significant adverse effects, but proposes no mitigation by Millennium. Millennium should be required to provide mitigation for the amount of increased accidents that can be attributed to its share of rail traffic, based on actual data, not modeling.

It is not clear from the DEIS how much this increase in accidents can be reduced by upgrading rail tracks and facilities or if other measures will be necessary. The DEIS states that the capacity of segments of the BSNF mainline will be exceeded by 1 to 34 trains per day. The DEIS suggests that the railroad companies will upgrade their tracks and facilities in response to new freight demands, and reminds us that the state of Washington has no direct control over these commercial decisions. However, the rail industry has a recent record of waiting until AFTER rail congestion problems to upgrade lines—even at the Powder River Basin itself (UP, BSNF 2006). The oil train derailment near Mosier on June 3, 2016, after recent routine inspections and minor repairs to the track, is evidence that business as usual will not be sufficient to have safe operations of fossil-fuel-bearing trains. The final EIS should not be issued unless the railroads produce publicly available plans and committed funds for upgrades in anticipation of increases in freight train traffic.

Finally, this analysis of future train accidents is incomplete because it does not calculate the number of accidents that would be caused by increased rail traffic by Millennium on tracks outside Washington State. The Final EIS for Washington should not be issued until a plan can be finalized with other states for the share of mitigation that Millennium should pay for accidents in their jurisdictions.

EFFECTS ON HUMAN HEALTH FROM COAL TERMINAL OPERATIONS

- **Particulate Matter in Longview –**

According to the model used to predict the levels of particulate matter in the DEIS, the Millennium project will not produce particulate matter above the minimum level of U.S. standards. However, Table 8 of the SEPA Air Quality Technical Report shows that the pollution level of PM10 (particulate matter less than 10 micrometers in diameter), will increase from background levels of 23 $\mu g/m^3$ for a 24-hour mean to 108 $\mu g/m^3$ due to emissions from handling coal, coal storage piles, and mobile source exhaust emissions from the operation and maintenance of the facility. While this model predicts levels of the most damaging size of particulates below the National Ambient Air Quality Standard (NAAQS) of 150 (p. 3-7), it still predicts more than a tripling of the amount of dangerous particulates at the site. In addition, despite being below the NAAQS, there is every reason to believe that residents exposed to this level of particulate matter will still suffer from health effects such as cardiovascular and respiratory diseases. The World Health Organization (WHO) suggested standard for particulate matter is 50 $\mu g/m^3$ 24-hour mean (Ambient 2014), and the 108 $\mu g/m^3$ created by operations in the terminal is more than double the WHO standard.

- **Other air pollutants in Cowlitz County –**

Many other air pollutants modelled for the DEIS show similar sharp increases as a result of all sources from the terminal, increases that make them closer to the NAAQS (150 $\mu g/m^3$), and over the WHO standard (50 $\mu g/m^3$). These other sources of pollution are nitrogen dioxide (NO2), sulfur dioxide (SO2), and PM2.5 (particulate matter less than 2.5 micrometers in diameter). Exposure to these pollutants contributes to a host of health problems.

- **Improved Monitoring and Mitigation of Coal Dust, Particulates, and Other Pollutants in Longview –**

The DEIS's conclusions are based on its modelling. The only way to confidently know if mitigation is needed for these pollutants is to monitor the levels of particulate matter once the project begins operations. Cowlitz County has only one particulate matter sensor, 1.5 miles to the east of the Millennium site, so new monitors will be needed.

According to the DEIS, as part of mitigation Millennium would install one fence-line particulate matter monitor and report pollution levels to the Department of Ecology for five years. This is inadequate for a 23-year project which will not reach full capacity until 2028. Monitoring should take place for the entire period of the project and beyond, after cleanup of the project site. It should also include installing more than one monitor at the fence line, and it should be for all pollutants regulated by federal and state laws, not just particulate matter.

While DEIS's modelling states that particulate pollution will be negligible outside of the 50 foot area immediately surrounding the project site, the only way to find out the true extent of particulate pollution is to install monitors at further distances. Since coal dust is deposited on houses up to one mile away near the McDuffie Terminal in Mobile, Alabama (Weis, Barraza, and Brantley 2016), it is probable that microscopic particulate material will also be deposited at long distances in Longview. Monitors should be installed in neighborhoods 100, 500, 1000 and 3000 feet from the project site, and in all directions, since the terrain is partly hilly and prevailing winds are variable from winter to summer. To protect the health of Longview citizens, we should rely on actual data instead of predictions from models.

In addition, the mitigation measures in the DEIS, if pollution levels do exceed the U.S. minimum standards for particulate matter, are left up to Millennium and the Department of Ecology to decide in the future. The Final EIS must specify what those mitigation measures will be. For example, will residents' homes be bought and payment made for their relocation, or will Millennium pay for their current and future health effects? Perhaps the Millennium project, like other recent coal terminal proposals near populated areas, such as the ones proposed for Coyote Island in Oregon (Flatt 2013) and Oakland, California (La Ganga 2016), should enclose the coal storage pile in a high-roofed or domed building and have completely enclosed transfer systems. The purpose of an EIS is to predict and find solutions to environmental problems before they materialize—the final EIS should include concrete plans for mitigation if actual recorded levels of pollutants are recorded in the future.

- **Populations in Poverty -**

The DEIS states that exposure to this particulate matter pollution is a problem for social justice—Cowlitz County has a large proportion of its population (about 20%) living below the federally defined poverty-line. There is evidence that people in poverty who live in areas polluted by particulate matter are disproportionately affected in terms of their health—hypothesized causes are related to the cumulative health stressors and lower mobility of people in poverty. However, acknowledging this problem is not the same as solving it, and the DEIS proposes no solution nor mitigation. Also, what the DEIS does not mention is the high level of poverty in the Longview neighborhoods closest to the proposed coal terminal site – especially south of Ocean Beach Highway (State Highway 4) and the Highlands neighborhood. Similarly, populations living and working near the tracks carrying open coal cars are likely to be in poverty. The social justice issue posed by this proposed project is higher than acknowledged in the DEIS. Mitigation for all the populations in poverty who will be affected by the coal dust pollution should be acknowledged, monitored, and mitigated.

EFFECTS ON WILDLIFE

- **Habitat for Columbia White-Tailed Deer**

The federally listed Columbia White-Tailed Deer lives on land and islands in the project area. The DEIS states that these deer were seen on the project property—this is consistent with the species' presence and stable population on Puget Island and other habitat with human activities (Azerrad 2016). Although the federal government has proposed that increasing numbers of the deer mean that it can be down-listed from endangered to threatened (Florip 2015), Washington State Department of Fish and Wildlife recommends retaining state designation as endangered, because the number of deer remains relatively low, and the Washington population remains at risk for flooding, disease, and faun predation. One of the main concerns is persistent problems with dispersal due to artificial barriers such as highways and unsuitable habitat (conifers) that surround the species' current habitat. (Azerrad 2016). The DEIS does not address the effects on the ability of the project to further disrupt deer movement through its habitat. Just stating that the deer are present on the project site and proposing no mitigation for disrupting their use of the site is not acceptable. The DEIS also proposes no mitigation for adverse effects on these deer from increased vessel traffic and high vessel wakes, especially on islands already prone to flooding.

- **Habitat for birds**

The DEIS states that the proposed coal export terminal is only 5 miles upstream from Crims Island which supports critical habitat for the federal threatened and state endangered Streaked Horned Lark. As the DEIS also states, Purple Martin nest sites have been documented just 2 miles from the terminal site at Coal Creek Slough, one of two nearby Washington State Birding Trail sites. Suitable nesting and foraging habitat for listed species such as the Bald Eagle, Peregrine Falcon, Vaux's Swift, and several waterfowl species including climate-sensitive Barrow's Goldeneye, exist well within the reach of anticipated coal dust deposits. In particular, Lord Island supports significant numbers of wintering ducks and geese. The DEIS states that

there may be adverse effects on these birds from coal dust deposited from the coal terminal project during operations. The DEIS states "In general, there is a paucity of peer-reviewed scientific literature examining the potential effects of coal dust on wildlife, in particular, on terrestrial wildlife" (SEPA Wildlife Technical Report, p. 3-18). DOE should commission studies on the effects of coal dust on birds before issuing the Final EIS. Also, any mitigation should not depend on models of coal dust deposits but instead should be based on actual measurements of coal dust deposits when the project is operational. This will mean installing detectors for particulate matter on Lord Island, at the least.

The rail and vessel corridors servicing the proposed coal export terminal support habitats of critical importance to a variety of bird species. The Columbia River Estuary represents prime stopover habitat for migratory shorebirds and waterfowl within the Pacific Flyway. The western extent of the estuary is a designated Western Hemisphere Shorebird Reserve Network site (Columbia River Estuary 2009) that supports large numbers of shorebirds during migration. Some of the largest colonies of Caspian Terns and Double-Crested Cormorants in the world nest and roost on islands within the estuary (East Sand Island 2016). Avian species lists for the estuary top 300 species, reflecting the diverse habitats available (River Species 004).

The DEIS states there will be adverse impacts to shoreline vegetation and nearshore fish, specifically forage fish species such as eulachon upon which marine birds and mammals rely. We are also concerned about potential disturbance to birds caused by vessel traffic, including the effects of wake on the birds themselves and impacts to their nesting, roosting and foraging areas. As discussed below, mitigation for impacts to marine wildlife are inadequate.

- **Habitat for marine wildlife**

Construction in the Columbia River – The DEIS acknowledges harmful effects from removing old piles and driving new ones to support the new docks. These include sudden and sustained levels of noise, turbidity of the water, removal of benthic organisms by dredging, and so on. The mitigation proposed for the construction impacts seems adequate since that area of the river is already disturbed by previous industry.

However, while the project construction window of Sept.1 to Dec. 1 will prevent harm to most juvenile and spawning "focus" fish such as listed salmon, sturgeon, and eulochon, adult fish migrating through the project area may be harmed by noise. No mitigation is proposed for the harm to these adult fish, and mitigation to protect eulochon is vague—i.e., monitoring and unspecified conservation steps. Specific plans for mitigation must be included in the final EIS.

Coal Dust -- According to the DEIS, during operations the Millennium project will create dust from loading and unloading ships between the docks and loading area, but the amount of deposition will not cause serious adverse effects to marine wildlife. The DEIS bases this conclusion on a review of studies on the effects of coal dust in marine waters by Ahrens and Morrissey (2005). However, Ahrens and Morrissey's conclusion in their study was that the studies reviewed were inadequate, and more research of higher quality is needed. There is certainly enough evidence to suggest that both physical smothering by coal dust and coal leachates cause harm to flora and fauna, especially juvenile fish and crabs (True Cost 2012).

Until there is more evidence that coal dust is not a problem for marine wildlife, the DEIS conclusion of no adverse effects is premature. No Final EIS should be issued until thorough studies of both physical effects and leachates are concluded, including how coal dust will be taken downstream by the river and dispersed, and how much this dilution may reduce negative effects on living organisms, if at all.

Coal Spills - According to the DEIS, Millennium's loading equipment and docks will be designed to minimize coal spills, and a spill kit will be nearby during operations. However, the DEIS has no estimate of the probability of coal spill accidents, despite the fact that in 2012, Westshore Terminal in Delta, British Columbia, had a large spill from a ship running into a pier (Hamilton and Crawford 2012) and there were also two rail accidents at Westshore Terminals in 2011 and 2012 (CN Rails 2013). After an estimate of the frequency and seriousness of this kind of accident in facilities similar to the proposed Millennium coal terminal is calculated, Millennium should be asked to provide a clean-up bond or other agreement to mitigate for probable future accidents.

Vessel Accidents – According to the DEIS, at full build-out in 2038, the Panamax and Hanamax vessels serving the proposed Millennium terminal will be 27% of the estimated traffic on the Columbia River, and at that point the vessels serving the project will have 20.90 collisions per year (p. 6-57). It is notable that this accident rate is based on those accidents which cause lost cargo—there is no estimate of the danger to humans and wildlife from the effects of any magnitude of accident from fire, explosion, and so on, which do not affect cargo. While the DEIS notes this high level of increase in accidents, it does not propose any mitigation, a serious lack which should be corrected in the Final EIS.

Fish Stranding – According to the DEIS, the increase in deep water vessel wakes will have variable effects, depending on tide level, perhaps the time of year, and the presence of sandy, permeable beaches. One such beach is at Barlow Point, just downstream of the proposed project site. A recent study reported in the DEIS showed that Chinook salmon juveniles were particularly susceptible to stranding at Barlow Point. The DEIS suggests that Millennium coal port vessels will slow down near Barlow Point because they will be near the terminal, and points out that the federal government regulates shipping speeds. However, a clear rule to enforce slow speeds can be included in the U.S. Corps of Engineers NEPA EIS expected this July, and a state final EIS should not be issued until that mitigation is included. In addition, rules should be created for slowdown, avoidance, and passage during high tide for similar downstream beaches--where studies are lacking, they should be conducted before shipping reaches high levels of traffic. The negative pressures on listed fish species are already great—the effects of large numbers of huge tankers should be minimized as much as possible.

Tribal and Other Access to Fish Resources – The DEIS acknowledges that the expected waits at train crossings from increased rail traffic will have an adverse effect on tribal access to traditional fishing locations when all cumulative projects are included. Moreover, the DEIS states that there will be adverse effects on tribal access to fish themselves from collision, noise, oil leaks and fish stranding from the projected cumulative increase in vessel traffic from all projects. By implication, fewer fish for tribes means fewer fish overall—for commercial and recreational fishing and for the survival of listed species. However, the DEIS does not suggest

any mitigation for Millennium's part in these cumulative adverse effects on access for tribal, commercial or recreational fisherman, nor for future generations which may lose these fish species.

GREENHOUSE GAS EFFECTS FROM BURNING COAL IN ASIA

There are two problems with the DEIS proposed mitigation for the increase in greenhouse gases that would be created by permitting the Millennium coal terminal.

- **Modelling –**

First, the model used by the DEIS for estimating greenhouse gas emissions is flawed. The DEIS does not estimate directly the effects of burning the 44 million tons that would be exported to Asia through the Millennium terminal. Instead, it uses the IPM computer model to estimate the effect of the export of 44 million tons of coal on carbon dioxide emissions in the U.S. and China. The goal of the model is to calculate the effect of higher coal prices in the U.S. (resulting in decreased coal use here) and the effect of lower coal prices in China (resulting in an increase in coal use there). The model incorporates many other factors besides coal price to calculate coal use, such as the lower BTU produced by Powder River Basin sub-bituminous coal, the effect on India's markets, and so on. The model uses four scenarios – low and high global coal use scenarios, a scenario based on coal use history through 2014, and a scenario based on changes predicted by the draft 2015 U.S. Energy rule. The forecasts that result from the four scenarios vary widely – two suggest that from exporting 44 million tons of coal to Asia there will be large net decreases in global coal usage, and two suggest small net increases. For proposing mitigation measures, the DEIS uses the smaller of the two net increases, the one predicted by the draft 2015 U.S. Energy rule.

However, the factors that are used in the computer modelling themselves cannot be accurately predicted. The factors come from estimates of future prices of coal, future use of coal of different types in Asia and the U.S., responses of future U.S. and Asian coal markets to regulation by the Paris Accord, and so on. These are simply not knowable. For example, the scenario that was chosen for proposed mitigation measures, the one based on the draft 2015 U.S. Energy rule, is unpredictable because it depends on politics as well as coal markets. Implementation of the rule could be stopped or delayed by a federal administration that denied the effects of climate change, is not convinced that other nations are doing their part to reduce greenhouse gases, or is simply determined to shield American businesses from regulation. Similar problems with very muddy estimates for factors exist for the other three scenarios that were modelled.

<u>When computer models of complex situations are based in large part on unknowable factors, they are not reliable</u>. Instead of depending on modelling, mitigation measures should be based on real effects on U.S. and Asian coal use and greenhouse gas emissions after events unfold. The total increase in global greenhouse gas production from exporting 44 million additional tons to Asia can be calculated from actual data that are measures of the factors that are input into the IPM model, or perhaps other factors that arise. Millennium should be required to pay mitigation based on the increases in global emissions after they are calculated for each past year, not predictions from a flawed model.

- **Mitigation Measures –**

The DEIS proposes that Millennium create measures that will mitigate for 50% of the estimated greenhouse gases that the proposed terminal would create. However, although the DEIS states "the measures must achieve emission reductions that are real, permanent, enforceable, verifiable and additional" (p. S-58), none are specified. The final EIS should describe what the mitigation measures will be. Also, Millennium should pay to mitigate the full 100% of the greenhouse gas emissions, or the Asian importers should pay to make up the difference that Millennium does not pay. Millennium should not be issued permits until that agreement with Asian importers is concluded. Otherwise DOE will be permitting a project that leaves half of the considerable increase in greenhouse emissions with no mitigation.

CONSERVATION AND ENVIRONMENTAL JUSTICE -

There are a number of conservation issues that are outside of the scope of the DEIS but are concerns of environmental groups; the state of Washington can work for these changes, with input from the Department of Ecology.

- **Environmental effects of increased coal mining –**

The Millennium terminal will raise prices for Powder River Basin (PRB) coal in the U.S. This higher price in turn will cover the costs of deeper mining in the mine fields, mining at levels where there is more overhang. Without higher prices, many of the PRB fields will have to be abandoned (Bleizeffer 2015). The coal companies will benefit from the ability to continue to exploit the same fields as well as from higher prices and more demand for their product. However, the environment in the area of these mines has well-documented problems. Coal fields replace range land, and only 7% of that land has been restored to full use. Residents complain of not being able to drink well water because of its sulfur dioxide content (Braasch 2015). The DEIS mentions the potential for increased coal dust from loading coal at the mines and along rail lines between the mines and Washington State. Pollution problems in other states are not under the direct purview of Washington State's Department of Ecology. However, as part of the U.S. Corps of Engineers NEPA of regional effects of the proposed Millennium coal terminal, the Washington Department of Ecology should be a partner in discussions about mitigation for the increase in pollution that will result from increased mining in the Powder River Basin mines.

- **Health effects of burning coal in Asia –**

The coal companies that own Millennium will receive most of the short and long-term benefit from the proposed project. Similarly, in both the short and long-term, Asian importers will benefit from coal prices that are lower than the current norm in their market. According to the DEIS, most of the 44 million tons of coal exported by the terminal will be bought by the Chinese. However, these lower coal prices will not benefit the Asian population in the long term because they will incentivize more use of coal in power plants. This in turn will create more pollution of Asian, especially Chinese, air and soil from particulates, mercury, and sulfur dioxide, and will prolong and increase well-documented adverse health effects on their human

and wildlife populations. In effect, the U.S. is off-shoring the adverse health effects of Millennium's project. No mitigation measures are proposed in this DEIS, but in the future Washington's laws should address this kind of externalizing of environmental destruction.

- **State-wide dis-incentives for greenhouse gas creation –**

The Millennium coal terminal project actually incentivizes some parts of the state to benefit from exporting greenhouse emissions while the citizens of the state, and some communities in particular, are sacrificing to decrease greenhouse emissions. In the big picture, the short-term construction boom of jobs, and creation of 135 to 200 permanent jobs in a Cowlitz County job market of 38,100 non-farm jobs (Nonfarm Employment 2014) are small factors in Cowlitz County's economy. Similarly, the tax contributions from this project would be small—for example, $1.6 million taxes per year during operations in an overall annual budget of $200 million in Cowlitz County (Proposed Amended Budget 2015). Despite their negligible total impact, these jobs and taxes are being promoted by Millennium and some of their supporters as a major contribution to our local economy.

At the same time, utility customers throughout the state are paying higher rates to subsidize production of green energy, and state funds are used to support green energy projects. Some communities are bearing a more direct burden in the shift to energy sources that do not produce greenhouse gases. For instance, to meet state goals for reduced greenhouse gas emissions, the coal-fired electricity plant will be closed in Centralia (Profita 2015), and a permit for a new coal-gas electricity plant was denied in Kalama (Olson 2013).

Millennium and its coal company owners will benefit most from this project, and the DEIS makes some attempt to have them create mitigation measures to restore or partly restore its environmental damage to the planet through greenhouse gas emissions. Washington law needs to extend this kind of mitigation to local and state governments. Instead of reaping only tax and job benefits from the new coal terminal, local governments such as the city of Longview, Cowlitz County, and the state of Washington should be required to pay mitigation for part of the increase in greenhouse gases that will result from shipping 44 million tons of coal to Asia. The Department of Ecology should help propose and support future legislation that includes local government mitigation for greenhouse gas emissions or some other way of evening out the playing field; the goal of this legislation should remove the incentives for local elected authorities to undermine overall state policy to reduce greenhouse gases.

Conclusion

Thank you again for the opportunity to comment on this DEIS. We emphasize that no final EIS should be published until the Health Impact Assessment is completed, as well as studies to find out the true extent of adverse effects of coal dust on humans not working in the coal industry, marine life, and birds, and to evaluate the effectiveness of measures to reduce dusting from coal rail cars. In addition, we have highlighted severe problems in analysis and proposed mitigation measures, or lack thereof.

Because of these major deficiencies and omissions, we recommend the "NO ACTION" alternative.

Sincerely,

Charlotte Persons

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Submission Number: ***TRANS-LV-M2-00109***

Received: 5/24/2016 12:00:00 AM
Commenter: Charlotte Persons
Organization: Willapa Hills Audubon Society
State: Washington

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments

Submission Text

I am Charlotte Persons (phonetic), and I've lived in the Longview/Kelso area for 24 years. I am here to represent Willapa Hills Audubon Society, which is a chapter of the National Audubon Society. Our area, our region is from Woodland to Astoria on both sides of the Columbia River.

We have been protecting habitat for humans and wildlife for over 40 years. And most of our members live in the Long Beach, Kelso area. We have deep historical roots here and we have had many different fights to protect our environment.

Willapa Hills Audubon Society will provide written comments that will analyze the data science and modeling presented in the DEIS. In fact, at this point there are over 20 pages.

Our concerns about the inadequate data and modeling and analysis is matched by our concerns about the inadequate mitigation that's proposed for many different problems raised in the DEIS. We have concerns about many parts of the DEIS, but I want to talk about fish.

Why fish? Because they are such an important iconic part of our ecology of the Columbia River. They are also important culturally and historically, as representatives of tribes have reminded us. And the representatives from recreational and commercial fishermen.

One of the conclusions of the DEIS is that there is no problem with the coal dust that will come off of the terminal. However, they are basing that on a study by Ahrens and Morrissey in 2005. And that study actually says the studies of that coal dust and its effect on marine life is inadequate. Please reject this and other kinds of inadequate science in the DEIS.

Submission Number: ***TRANS-LV-Q3-00031***

Received: 5/24/2016 12:00:00 AM
Commenter: Charlotte Persons
Organization: Willapa Hills Audubon Society
State:

Agency: Cowlitz County and the Washington Department of Ecology
Initiative: Millennium Bulk-Terminals Longview SEPA DEIS
Attachments: No Attachments
Submission Text
I'm Charlotte Persons, and I have lived in the Longview-Kelso area for 24 years. I'm here to represent Willapa Hills Audubon Society, a chapter of the National Audubon Society.

For over 40 years we have been protecting habitat for both humans and wildlife in Southwest Washington and across the river in Oregon, from Woodland down to Astoria. Most of our members, however, live in the Longview-Kelso area.

Willapa Audubon Society will submit written comments that analyze the data, science, and modeling presented in the Draft Environmental Impact Statement.

Our concerns about the inadequate data and analysis, and especially inadequate mitigation proposed is why we are urging the no action alternative in the DEIS.

We have concerns about the DEIS but today I will focus on fish in the Columbia River. Fish are an integral part of the ecology of the river, as well as part of our historical and cultural connection to all of our ecology in our region.

The DEIS states that coal dust from the Millennium Terminal Project will not affect negatively the fish in the Columbia River. However, the DEIS bases their conclusion on a review of studies of the physical and chemical effects of coal dust on marine organisms by Ahrens and Morrissey in 2005. This is an inaccurate interpretation of that Ahrens and Morrissey study. They conclude that the studies are not just sparse but inadequate. They call for more scientific studies of the effect of coal dust on marine environments.

Willapa Audubon Society has also asked for more studies about these effects in our comments for the scope of this Draft Environmental Impact Statement in 2013. We call for them again.

And the final DEIS should not be issued until third-party investigators produce clear evidence of the true effects of coal dust on fish and other marine organisms.

While the Draft Environmental Impact Statement states that there are no effects from coal dust, it does say that the cumulative effect of all the new traffic on the river, 27 percent which will be from the Millennium Project, will be detrimental to the tribes' ability to fish because of the negative effects of so many vessels of such huge size.

However, the DEIS does not suggest any mitigation for this loss. This loss will not be just for the tribes' access to fish but to the fish themselves which benefit commercial and recreation fishing, and all of us in this region, as they are integral to all ecology.

Another problem in the DEIS is fish stranding, especially of juvenile Chinook salmon. The DEIS says that this will not be a problem on the closest beach at Barlow, although the studies say that it will -- that's where most fish in our area are stranded -- because the ships will be slowing down. The DEIS says that the federal government will regulate shipping.

We should not permit this project until the federal regulations for the fish -- for the ships along the river state that

ships should slow down and avoid these where there's more likely to be fish stranding, and also that they should have this traffic at high tides, when there's less possibility of stranding fish.

Finally, one of the important aspects of the DEIS is proposed mitigation for greenhouse gas emissions from burning the coal in Asia.

There are many problems with the modeling that is created for the DEIS. But the main thing is that the factors are many of them based on political processes that cannot be foreseen.

For example, the DEIS model that's chosen based on the 2015 regulations says that it may not ever be implemented. That scenario may never be implemented because we are unable to control new federal administrations -- or predict new federal administrations that may not ever implement these plans because they do not believe in the reality of the global climate change or wish to slow down the implementation, or simply wish to protect us in this interest.

There are so many factors that cannot be predicted in these models that vary wildly in their results, and we should not use them as a way of creating a mitigation plan.

On the other hand, greenhouse gas emissions already are affecting fish in our estuaries in the Columbia River because of the lack of, the lessening of glaciers, the predicted impacts on rain patterns which will create less snow pack and less water to go over the dams and keep fish alive. All of those things are not mentioned in the DEIS. These effects are just as real as many other effects on people from the greenhouse gases, and they are in no way -- there's no place in the DEIS where those kinds of mitigations are proposed.

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MAY 19 2016

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May 19, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Millennium Bulk Terminals-Longview Proposed Action – Public Comment

Dear ICF International:

The Wyoming Business Alliance supports the Millennium Bulk Terminals-Longview, LLC (Millennium) proposal to construct and operate a marine terminal for export of coal in Cowlitz County, Washington.

As Wyoming's premier business advocate, the Wyoming Business Alliance promotes a sustained and growing economy by connecting 6000 business leaders from across Wyoming. We represent business interests and issues, and partner with key business organizations and trade associations. A lasting voice for business which facilitates a growing, proactive, and inclusive business environment is essential to thoughtful public discussion.

Wyoming coal mines produced about 375 million tons of coal last year. The financial contribution to state and local governments in the form of taxes, royalties and fees is enormous -- approximately $1 billion for a state of only 570,000 people. Wyoming's share of federal mineral royalties – royalties paid to mine the leased coal - was over $200 million. In the last 10 years, 90% plus of K-12 school construction totaling $3 billion has come from coal taxes.

The coal industry has been a mainstay to Wyoming's economy. Despite layoffs, the industry is still employing nearly 6,000 individuals directly with a payroll of nearly $700 million, and over 2,000 contractors. The average coal mining job pays over $83,000 per year, well above the state average. And every coal mining job supports another 2-3 jobs in the service and supply industry.

Safety to the employees and environment remains a top priority and core cultural value for Wyoming's coal mining industry. In fact, Wyoming coal mines and railways are recognized as some of the safest mining operations in the nation.

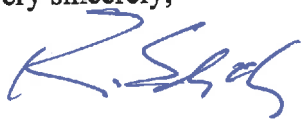
The Millennium proposal should be allowed to proceed due to its positive outcomes at every level:

- Affordable electricity, safe jobs, and secure homes for families;
- Robust economic opportunity to improve blighted community areas such as the former terminal site;

- For Wyoming and Washington, increased revenues to build highways, schools and human services funding;
- Regarding the federal government, revenues and environmentally sensitive development of our country's strategic coal resources; and
- Lastly, a way for under privileged nations in Asia to have access to clean Wyoming coal as they seek secure, reliable and affordable sources of energy to strengthen and build their economies.

Thank you for considering our thoughts on the Millennium project. We are more than happy to provide additional information or answer questions you may have.

Very sincerely,



Bill Schilling
President

325 W 28th Street, Suite 1
Cheyenne, WY 82001

June 13, 2016

Millennium Bulk Terminals – Longview SEPA EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, Washington 98104

SUBMITTED VIA E-MAIL AND VIA U.S. POSTAL SERVICE

Dear members of Cowlitz County and Washington Department of Ecology:

I write on behalf of the Wyoming Infrastructure Authority to express Wyoming's strong support for the Millennium Bulk Terminal (MBT) project and submit the following comments.

Wyoming is coal country. Wyoming is first in the country for coal production, a position it has held for years. Wyoming is home to more than 1.4 trillion tons of coal resources in seams ranging in thickness from five feet to some in excess of 200 feet in the Powder River Basin (PRB). Recent estimates indicate that Wyoming has more than 165 billion tons of recoverable coal. Wyoming's growth as the center of the nation's coal production has been driven by its low sulfur composition, its lower production costs due to coal's proximity to the surface and its world-class recoverable seams.

Coal mining companies pay taxes and royalties to federal, state and local governments. Coal is an important source of income for Wyoming is the state's second largest source of tax revenue for state and local governments. Coal contributed an estimated $1.1 billion in taxes to Wyoming in 2014.

In 2014, Wyoming was home to approximately 20 coalmines that employed 6,578 workers. Coal industry jobs are among the best paying jobs in the state. On average, a Wyoming coal miner earns $83,594 plus benefits – almost twice the statewide average of $46,480. Estimates indicate that each coal industry position generates three additional jobs in the state.

Despite its abundance and affordability, efforts to decrease the nation's use of coal have impacted the industry and Wyoming's economy substantially.

Wyoming uses coal revenues to fund all aspects of education in Wyoming, including K-12, community colleges and the University of Wyoming, supporting both operational and capital construction. Because of the declining coal market, school districts across Wyoming are forced to make budget cuts. To date, 92 full time education positions have been cut, with more cuts on the horizon that will adversely impact instruction in the classroom. Wyoming recognizes that Washington is facing a similar challenge with funding education amidst a budget shortfall. Last summer, the Washington Supreme Court found the Legislature in contempt of court for failing to fulfill their own definition of the resources necessary to meet the constructional requirement of providing a basic education to all Washington children. Our Legislature faces a similar challenge. MBT is an opportunity for Washington State and Wyoming to provide a new project and increase economic activity.

In addition to our shared challenge of funding education, Washington State and Wyoming have to consider the importance of providing jobs. The Millennium Bulk Terminal project is an opportunity to provide jobs and additional tax revenue to Longview, Cowlitz County and the State of Washington. As you know, the Proposed Action would have a direct economic construction output of about $232 million supporting about $70 million in direct wages. For Wyoming, two of the nation's largest coal mine operators, both located in Wyoming's PRB, have laid off hundreds of people because of a decline in domestic consumption of Wyoming coal. For years, the coal mining industry has directly employed some 6,500 people, providing a $700 million payroll. For Wyoming, the least populated state in the nation, this is a significant number of jobs. These workers, who earn wages well above the state average, have been a critical economic driver in many Wyoming counties. Each coal mining jobs support an estimated three jobs in the service, supply and support industries around the state. Wyoming sees layoffs in these industries. Railroads, heavy equipment maintenance and machinists and the trucking industry have all suffered job losses. These layoffs not only hurt the coal miners who have lost their jobs, but our state's economy and communities.

Accordingly, Wyoming is encouraged to see that Asian demand for American coal is increasing. The United States holds nearly one-third of the world's total coal reserves. From a global perspective, Wyoming is sensitive to the fact that 1.2 billion people live in extreme poverty, lacking access to clean water and electricity. Access to affordable and, reliable energy provided by coal is key to sustained social and economic development for the world's poorest people.

With all these facts in mind, the Wyoming Infrastructure Authority (WIA) strongly supports the proposed Millennium Bulk Terminal (MBT) project. In 2004, the State of Wyoming created the WIA to boost the value of Wyoming's natural resources through investments in infrastructure. One of the areas of focus is the development of new coal export terminals. Wyoming is pleased to see forward movement on the project and Washington State's

commitment to ensure that the project receives the thorough review and analysis it is due through the issuance of the Draft Environmental Impact Statement (DEIS).

Wyoming is a public land state. The Bureau of Land Management, National Forest Service, National Park Service, and U.S. Fish and Wildlife Service manage nearly fifty percent of land located in Wyoming. As such, Wyoming routinely participates in federal land management processes pursuant to the National Environmental Policy Act. We appreciate the opportunity to comment in Washington's State Environmental Policy Act (SEPA) and further want to thank you in advance for the thoughtful consideration your state will afford Wyoming's comments.

As explained in the draft environmental impact statement (DEIS), there are three categories of environmental resources: (1) Build Environment; (2) Natural Environment; and (3) Operations. Wyoming offers the following comment on each category.

1. Built Environment

Wyoming sees no overwhelming analysis indicating that impacts to the Built Environment should prevent the Proposed Action from moving forward. As explained, the Proposed Action would:

- Not change land and shoreline use of the project area and would not change the land use character (S-12);
- Have negligible impacts on social and community cohesion and access to public services (S-12);
- Generate economic impacts in terms of jobs, wages, and economic output, as well as state and local sales and use revenues and business and occupation tax revenues (S-13);
- Not anticipate significant impacts on water and sewer service (S-13);
- Require implementation of railroad Quiet Zones to address increased noise impacts on minority and low-income populations (S-14);
- Provide visual features consistent with the general industrial context of the surrounding area (S-14 to S-15);
- Impact the designation of the Reynolds Metals Reduction Plant Historic District from retaining its eligibility for listing in the National Register of Historic Places, though a Memorandum of Agreement could resolve some of those impacts (S-15 to S-16);
- Not be expected to affect cultural resources (S-16);
- Result in impacts on tribal resources by causing physical or behavioral responses in fish or impacting aquatic habitat, though these impacts could be reduced through proposed mitigation measures (S-17);
- Require the Applicant to obtain a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit and follow local and state

construction and demolition standards, including best management practices (S-17 to S-18);

- Require an NPDES Industrial Stormwater Permit and although new sources of hazardous material could be introduced, such as fuel, oil, grease, lubricants, hydraulic fluids, solvents and acids, such substances would be stored in small quantities and federal, state and local laws require plans for rapid reporting and clean up of such instances (S-18);

These impacts have been thoroughly analyzed and provide for mitigation, best management practices and compliance with local, state and federal laws. These measures support continued approval of the Proposed Action.

2. Natural Environment

Wyoming sees no overwhelming analysis indicating that impacts to the Natural Environment should prevent the Proposed Action from moving forward. As explained, the Proposed Action would:

- Involve ground-disturbing activating which could increase soil erosion, though on-site erosion hazard is relatively low due to the flat condition of the site and impacts to underlying soils could be avoided through standard engineering and construction methods (S-19);
- Potentially affect surface water in the study area by altering drainage patters, though once operational, impacts on surface water and floodplains would be considered low (S-20);
- Result in 24.10 acres of permanent wetland loss though proposed mitigation would compensate for the loss of wetlands; once operational, the analysis found no impacts on wetlands (S-21);
- Groundwater recharge patterns on the deep and shallow aquifers would not result in a significant impact (S-21);
- Require the applicant to obtain a NPDES Industrial Stormwater Permit and develop a separate system of stormwater collection, treatment and discharge regulated by the permit; potential impacts on groundwater recharge or effects on groundwater supply are not considered significant (S-22);
- Disturb soil, though the Applicant would be required to obtain a NPDES Stormwater Construction General Permit and avoid and minimize short-term and long-term impacts on water quality (S-22);
- Require using materials and products that could introduce pollutants into surface water, though such outcomes could be addressed by the development and implementation of a site-specific construction Stormwater Pollution Prevention Plan that includes best

management practices for material hanlding and construction and waste management to reduce potential for water quality impacts (S-22 to S-23);

- Require in-water work and dredging that would disturb sediment on the river bottom, though the Applicant would be required to use standard best management practices that would help maintain acceptable water quality conditions during construction (S-23);
- Require demolition of existing structures, and thus, having the potential to affect water quality by disturbing soil or debris containing hazardous or toxic materials, though such impacts would be minimized by collecting and removing such debris and collecting and treating all stormwater from the site prior to discharge (S-23);
- Require the Applicant to develop a Water Quality Monitoring and Protection Plan, as approved by state and federal agencies, to avoid and minimize impacts on water quality (S-23);
- Permanently remove approximately 37 acres of non-wetland vegetation by clearing and grading during construction, though most of the clearing activities would affect already developed and disturbed portions of the project area that generally do not support native plant species or provide suitable habitat for animals (S-24);
- Include possible colonization of noxious weeds, though implementation of proposed mitigation measures could avoid and minimize invasion and colonization of noxious weeds (S-25);
- Would require the Applicant to utilize equipment and system operations to address concerns about fugitive emissions from coal dust from being deposited on vegetation, soils and sediments (S-25);
- Would address construction impacts on fish to reduce the noise level during in-water pile-driving activities (S-25);
- Require best management practices to ensure that the Proposed Action, once operational, would minimize impacts of shading on fish; further, fugitive coal dust and potential spills are not expected to significantly affect fish because potential risk for exposure is relatively low (S-26);
- Permanently remove terrestrial and aquatic habitats during construction that would affect wildlife though 151.61 of 201.95 acres of terrestrial habitat is comprised of previously developed or disturbed lands that do not generally support wildlife (S-27);
- Would require a continued commitment to monitor impacts of wildlife because, as the DEIS explains, there could be potential impacts once the Proposed Action becomes operational; the DEIS highlights areas where the Applicant can reduce risks for impacts (S-27 to S-28); and
- Would increase energy consumption, though the demand for energy would not be significant compared to current demand and would be met by the existing local and regional supply; the same holds true for demand for gravel, dirt and wood which would be available by existing local and regional supply (S-28 to S-29).

Again, these impacts have been thoroughly analyzed and provide for mitigation, best management practices and compliance with local, state and federal laws.

3. Operations

The DEIS analyzes the impacts for the operations resources, paying particular attention to rail transportation, rail safety, vehicle transportation, vessel transportation, noise and vibration, air quality, coal dust and green house gas emissions.

At the outset, WIA agrees with the DEIS' findings that, "There would be no unavoidable and significant adverse environmental impacts from coal dust." (S-37 and Chapter 5.7.8, page 5.7 to 5-27) Opponents of the project have incorrectly characterized that trains hauling coal to the facility would leave behind clouds of coal dust, causing significant human health and environmental impacts. This argument is without merit. Operators load coal into rail cars with a specific aerodynamic shape which helps eliminate dust. Coal operators and the railroad companies have also employed dust surfactants to the coal. These surfactants dry to form a non-toxic "crust," which virtually eliminates dust emissions.

Wyoming has a strong interest in ensuring that when PRB coal leaves our state, it does not do so leaving behind a cloud of dust. Perhaps the greatest evidence of the lack of environmental and human health impacts from coal dust is shown in the Powder River Basin coal mining area. During peak coal production, more than 100 trains left the area daily. This figure represents significantly higher train traffic than that which would be created by Proposed action. A visual survey of the landscape showed no impact from coal dust. Even more telling is Center for Disease Control data that shows in 2013, Wyoming's asthma rates were 9.1%, compared to 9.9% for the State of Washington. *See* www.cdc.gov/asthma/most_recent_data_states.htm. Wyoming has nearly a 10% lower rate for asthma, while having many times more coal trains passing through it than Washington. Asthma may be an issue in Washington, but it is not due to coal trains.

That said, Wyoming sees no overwhelming analysis indicating that impacts resulting from Operations should prevent the Proposed Action from moving forward. As explained, the Proposed Action would:

- Not exceed the capacity of the Reynolds Lead, BNSF Spur, and BNSF main line routes to transport construction materials (S-29);
- Require railroad companies to make investments and operating changes to accommodate growth in rail traffic (S-29);
- Increase the potential for train accidents, though implementation of proposed mitigation could address such impacts (S-30);
- Increase vehicle traffic and would require investment in addressing increased traffic (S-31 to S-32);

- Require implementation of proposed mitigation measures to support the DEIS's conclusion that increased vessel traffic could be managed within the existing infrastructure and systems for vessel management in the lower Columbia River and would not have a significant impact on the vessel transportation system (S-33);
- Require, as previously discussed, mitigation measures such as implementation of a Quiet Zone to address noise impacts (S-34);
- Not cause a significant change in air quality during construction and estimated maximum concentrations for each criteria air pollutant emitted from rail and vessel transport would be below National Ambient Air Quality Standards (S-35).
- Have a 0.3% increase in the total Cowlitz County carbon monoxide and volatile organic compounds emissions (S-35); and
- Require applicant to follow coal dust-control retirements to ensure that impacts of PM10 and PM2.5 emissions from rail transport related to the Proposed Action would remain below applicable federal and state air quality standards (S-36 to S-37);

These impacts have been thoroughly analyzed and provide for mitigation, best management practices and compliance with local, state and federal laws.

Finally, Wyoming strongly disagrees that the DEIS reference to life-cycle carbon emissions is warranted.. Further, as highlighted in the DEIS, greenhouse gas emissions outside Cowlitz County, once the project becomes operational, would be driven primarily by coal combustion in Asia and the United States. Within the coming years, as clean coal technology continues to develop, it cannot be said with any certainty how many metric tons of CO_{2e} will be released. The DEIS compares this to the equivalent of adding 672,100 passenger cars on the road each year. The DEIS concludes that projected greenhouse gas emissions would be significant and unavoidable.

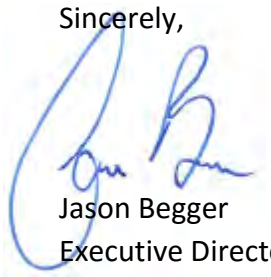
Wyoming has several concerns about this analysis. First, this type of analysis should have no bearing on this project itself and in fact, could set a sweeping precedent for other products exported out of the state. Jets and airplanes, for example, have significant lifetime carbon emissions that Washington should analyze under this precedent. Second, the national conversation about climate change ignores potential benefits of a warmer climate, such as increased CO_2 and precipitation would increase biomass by 40 percent. Finally, climate change advocates argue that as global warming increases temperatures, more people will die in heat waves. Such arguments never mention how a warmer climate will result in significantly less cold-related deaths. Only mentioning the negative aspects of climate change distorts the DEIS and should the co-lead agencies decide to continue its discussion about potential climate change impacts, it may wish to consider both sides of this already highly politicized argument. Wyoming, by contrast, would recommend only including a discussion about greenhouse gas emissions resulting from the construction and operations of the Proposed Action.

In conclusion, the co-lead agencies have done tremendous work in analyzing the Proposed Action, which includes the incorporation of 217,500 comments received during the scoping process. Of the many bulleted areas described above, the vast majority of impacts can be addressed through mitigation and best management practices.

Of the nine "unavoidable and significant impacts" identified in the DEIS, Wyoming is confident that interested stakeholders can make the Proposed Action work and we appreciate your continued work.

Thank you for the consideration of our comments. Please let me know if I can provide further information.

Sincerely,



Jason Begger
Executive Director, Wyoming Infrastructure Authority

Wyoming County Commissioners Association

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Pete Obermueller, Executive Director • **Gregory Cowan**, Natural Resource Staff Attorney

WCCA Committees

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Jim Hudelson
Chairman
Jim Hicks
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Elections & Land Use
Steve Maier
Chairman
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June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Millennium Bulk Terminals-Longview Proposed Action – Public Comment

Dear ICF International:

The Millennium Bulk Terminals-Longview, LLC (Millennium) is proposing to construct and operate a marine terminal for export of coal in Cowlitz County, Washington. The following comment letter in support of the project is being submitted on behalf of Wyoming County Commissioners Association (WCCA).

The WCCA is an organization consisting of the Boards of County Commissioners of all 23 Wyoming counties. As local government officials with direct responsibility for the economic stability of our counties, we are aware of the positive financial impact that this project may have on our counties' income stream. Collectively, we rely heavily on the revenue generated from the production of coal in Wyoming. Wyoming's counties depend on the production of coal to support our economic viability, as well as the economic viability of our entire state's economy. Revenue from coal production is necessary to fund essential governmental services.

Coal is a reliable and economically efficient energy source that will continue to be used for decades. The Department of Energy's Annual Energy Outlook 2015 predicts U.S. coal production could potentially increase 60 million tons by 2040. Wyoming itself produced over 375 million tons of coal last year in an environmentally friendly way that requires complete reclamation of the land. The financial contribution to state and local governments in the form of taxes, royalties and fees was approximately $1 billion. Wyoming's share of federal mineral royalties – royalties paid to mine the leased coal - was over $200 million. These revenue streams pay for K-12 school construction, highways, social services and higher education construction and operational funding.

Wyoming has been an international leader in clean coal research and development to ensure we will continue to be environmental stewards of our natural resources and their use. For example:

- New developments are expected in Integrated Gasification Combined Cycle (IGCC) technology to further enhance the efficiency of coal-fired generation.)
- The University of Wyoming School of Energy Resources is doing research to understand carbon capture and sequestration (CCS) processes.)
- In 2012, the Wyoming State Legislature directed $10 million to the University Wyoming School of Energy Resources for clean coal research.
- Since 2007 almost $41 million has been awarded by the Clean Coal Task Force for research in areas such as development of new technologies that reduce emissions from coal, integration of carbon capture technologies, and pilot-scale demonstrations of emerging technologies.

Just as Wyoming and the coal industry takes very seriously its obligations to reclaim land for native flora and fauna, the Millennium proposal should be commended for the vision to reclaim an industrial site currently unused, to make way for a safe and productive import-export facility. These activities have already improved the environment and will provide stable family-wage jobs and vital tax revenue for Longview, Cowlitz County, and both Wyoming and Washington state.

Thank you for considering our thoughts on the Millennium project. We are more than happy to provide additional information or answer questions you may have.

Sincerely,

Richard A. Ladwig

Richard Ladwig
WCCA President
Natrona County Commissioner

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JUN 07 2016

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May 31, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104

RE: Millennium Bulk Terminals-Longview Proposed Action – Public Comment

To Whom it May Concern:

The Wyoming Mining Association (WMA) is a statewide trade organization that represents and advocates for 37 mining company members producing bentonite, coal, trona and uranium, as well as one company developing a rare earth element mine. WMA also represents 129 associate member companies, two railroads, one electricity co-op, and 180 individual members.

WMA appreciates the opportunity to offer comment on the proposal by Millennium Bulk Terminals-Longview, LLC (Millennium) to create and run a terminal for export of coal in Cowlitz County, Washington.

Wyoming mines produced over 375 million tons of coal last year, and the financial contribution to state and local governments in the form of taxes, royalties and fees was about $1 billion. In the past two decades, bonus bids from the federal coal leasing program have totaled over $2.6 billion. This revenue has been dedicated to building schools, supporting community colleges and highways across the state, and keeping the tax burden low on Wyoming citizens. Every county in Wyoming has benefitted from these revenues.

The coal industry is critical to Wyoming. Following last month's devastation round of layoffs, the industry is still employing nearly 6,000 individuals directly with a payroll of nearly $700 million, and over 2,000 contractors. The average coal mining job pays over $83 thousand per year, well above the state average. And every coal mining job supports another 2-3 jobs in the service and supply industry.

While the state of Wyoming has traditionally been the primary beneficiary of Powder River Basin coal, export possibilities open the door for more communities to benefit, as well.

Millennium is looking to expand its existing operations by cleaning up the site of an abandoned nearby aluminum smelter and smartly redeveloping it into a port facility to export coal. Millennium expects the local economic benefits of the project will be substantial, generating more than $102 million in state and local tax revenue over a 30-year period and resulting in more than 2,600 direct and indirect construction jobs, as well as 300 permanent jobs. The port expansion project has received strong support from community leaders, organized labor, agriculture, and state and local business groups such as chambers of

commerce. The project would revitalize an industrial brownfield site, expand trade capacity, provide jobs, and boost long-term economic growth.

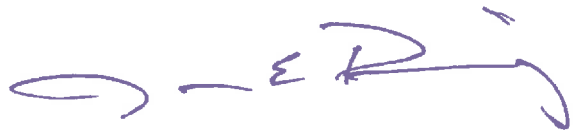
Regretfully, the State of Washington has proposed an unusual and unprecedented condition on the project in order for it to proceed: carbon offsets. As we understand it, the State is requiring Millennium to account for cumulative lifecycle greenhouse gas emissions associated with the project, including by purchasing offset credits for up to 1.3 million tons of carbon dioxide that will be emitted annually in Asia when the exported coal is used for electricity generation. The cost of such offsets could approach $25 million on the project.

As there appears to be no precedent for such a requirement of studying carbon impact in the lifecycle of a shipped product, it seems the coal industry has been singled out for political reasons. In fact, it is difficult to find a single port facility project that was required to do such an analysis for shipping materials such as cars, airplanes, oil and gas, heavy machinery, medical equipment and computers or agricultural products.

We would certainly hope that public policy makers would judge this project on the merits and benefits rather than politics.

Thank you for your consideration of these comments.

Sincerely,



Jonathan Downing
Executive Director