August 20, 2018

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Re: NWP-2017-41/APP0060697 Clean Water Act Section 401 and 404 Supplemental Public Comment Requesting Denial of Permit Applications

Dear Mr. Stine and Mr. Krug:

We provide this supplemental comment focused on the above Section 401 permit application representing the League of Women Voters of Coos County (LWVCC), LWV of Umpqua Valley (LWVUV), LWV of Rogue Valley (LWVRV), and LWV of Klamath County (LWVKC). On July 20, 2018, we submitted a joint comment to the United States Army Corps of Engineers (USACE) and Oregon Department of Environmental Quality (DEQ) under the same USACE Number noted above. We herein present information we believe is pertinent and compelling specifically regarding the Section 401 permit application, along with additional information relevant to evaluation of impacts from enlarging the federal navigational channel, dredging, and associated waterways alterations. We have included some information from our July 20 comment verbatim, in order to specifically respond to the issues DEQ must consider with regard to Oregon's Water Quality Standards during their evaluation of the Jordan Cove Energy Project's application for a Clean Water Act, Section 401 Certification.

We are grassroots nonpartisan, political organizations operating in the four counties in Oregon that will be directly affected by the construction and operations of the proposed Jordan Cove Liquefied Natural Gas (JCLNG) and Pacific Connector Gas Pipeline (PCGP), commonly referred to collectively as the Jordan Cove Energy Project (JCEP). Our detailed review of the proposed activities and documents for the JCEP shows that the projects are in direct conflict with many state and national League of Women Voters policies. These policies are based on study documents and resultant positions regarding natural resources, water quality and quantity, climate change, offshore and coastal management, land use, energy conservation, and seismic risks.

Since the 1950s, the League has been in the forefront of efforts to protect air, land, and water resources. The League of Women Voters of the United States (LWVUS) "believes that natural resources should be managed as interrelated parts of life-supporting ecosystems. Resources should be conserved and protected to assure their future availability. Pollution of these resources should be controlled in order to preserve the physical, chemical and biological integrity of ecosystems and to protect public health." The League of Women Voters of Oregon (LWVOR) ". . . opposes degradation of all of Oregon's surface and ground water. . . ." and declares that climate change is the greatest environmental challenge of our generation. And finally, at the 2018 National LWV Convention, the following resolution passed: "The League of Women Voters supports a set of climate assessment criteria that ensures that energy policies align with current climate science. *These criteria require that the latest climate science be used to evaluate proposed energy policies and major projects* (emphasis added) in light of the globally-agreed-upon goal of limiting global warming to 1.5 degrees C, informed by the successful spirit of global cooperation as affirmed in the UN COP 21 Paris agreement." We, as local Leagues, are part of the national and state LWV. Based on these positions and our understanding of the likely impacts of the proposed JCEP on critical environmental resources and communities in our areas, the LWVCC, LWVUV, LWVRV, and LWVKC submit jointly this comment on the JCEP's applications for a Clean Water Act Section 401 permit.

In our review of the details of this project we found the Applicant's overall approach to the Joint Permit Application (JPA) obstructive. The JPA provides information to support the JCEP's eligibility for the respective permits via piecemeal components that are difficult to navigate and even more problematic to find appropriate details. The synthesis of this entire project's documents is a challenge for reviewers—both within permitting agencies and the public. The disjointed approach in the assorted documents and separation of individual components from the likely combined effects on water quality and the environment highlight the problems. If this permit review is to continue, there is a need for public hearings as an additional attempt to clarify the applicant's assumptions, and help the public understand the project plans in a logical sequence. Above all, the Applicant fails to address the cumulative effects of this project on water quality during and after construction.

Our comments are provided in sections focusing on key aspects of the JCEP's activities for which the Applicant must obtain from DEQ certification that "there is a reasonable assurance that the activity will be conducted in a manner which will not violate water quality standards."[1] We have concluded that the Applicant has not met that requirement. To provide our review comments, we have organized comments to address why we believe the JCEP, despite numerous opportunities and assistance, still has not demonstrated that, 1) the proposed activities would not violate designated uses as established in Oregon's water standards; 2) the proposed activities would not violate either numeric or narrative criteria Oregon has adopted in its water quality standards; and 3) the proposed activities would not violate Oregon's Antidegradation Policy. We also believe that the Applicant's mitigation plans would not adequately compensate for the Water Quality Standards violations their activities will commit.

DEQ states in its description of its water quality certification evaluation that, "If protection of water quality standards, beneficial uses, and antidegradation cannot be assured, the *certification must be denied* [emphasis added]."[2] We provide reasons in these comments to justify our assessment that such assurance cannot be attained for

[1] 40 CFR 121.2(a)(3).

[2] "FAQ About 401 Permits. U.S. Department of Energy, RAPID Regulatory and Permitting Information Desktop Toolkit, https://openei.org/wiki/RAPID/Roadmap/14-OR-d.

the JCEP and on that basis, we respectfully but strenuously request that DEQ deny now the abovenamed permit application. As a result of our investigations of the extent and consequences of the project's proposed construction and operations, we conclude that the JCEP is not suited for the locations proposed. Moreover, if allowed to go forward, the project would subject important natural resources and Oregon communities to unacceptable risks.

Federal law requires that state water quality standards, ". . . shall consist of *the designated uses* of the navigable waters involved and the *water quality criteria* for such waters based upon such uses. Such standards shall be such as to *protect the public health or welfare*, *enhance the quality of water* and serve the purposes of this chapter. Such standards shall be established taking into consideration their use and value for *public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation* [emphasis added]."[3]

I. From what is known of JCEP proposed development and operation of facilities, we believe <u>designated uses</u> established by Oregon Water Quality Standards will be violated.

Designated beneficial uses for Oregon's waters are specified separately for the state's watersheds. Looking across the watersheds that would be impacted by the JCEP activities and operations, those uses are as follows: industrial water supply, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, commercial navigation and transportation, public and private domestic water supply, irrigation, livestock watering, and hydropower. We have reviewed OAR 340-041-0300, 0320, 0271, and 0180, including maps and other figures, to better understand how these designated beneficial uses might be affected by planned activities and operations of the JCEP and how the Applicant plans to protect them as Oregon's Water Quality Standards require. From our review, if the JCEP is allowed to go forward, protection of Oregon's designated uses will be extremely challenging, if not impossible. We also find that the Applicant fails to demonstrate how they will protect these many beneficial uses that exist throughout the regions affected.

We discuss the following beneficial uses at risk under Oregon's Water Quality Standards if JCEP goes forward as follows:

A. Public/private domestic water supply. Since water is life-giving, project activities that would present potential threats to drinking water quality and supply are among the most urgent reasons for our opposition to the JCEP. In our view and as we understand project parameters, there is little to assure that existing private water rights and water supplies will be protected. Details on specific stream crossings, the soils and slopes, and methods of excavation across the pipeline corridor leave considerable uncertainty as to both the methods and protections that will be needed to protect Oregon's drinking water use at each specific location and whether the JCEP gives adequate assurance that their operations would reliably implement those protections.

<u>Negative impacts on groundwater resources on the North Spit</u>. The Energy Terminal project on the North Spit is nearby the Coos Bay-North Bend water wells in the spit. These water rights are part of the infrastructure of the region for drinking and industrial water, and the wells represent an extensive aquifer that is highly interconnected. The

[3] 33 USC 1313(c)(2).

applicant acknowledges on page 31 of their Water Quality Considerations – Implications for Clean Water Act Sections 401 and 404 Permitting request that,

> The CBNBWB [Coos Bay North Bend Water Board] has 18 groundwater wells located within the Oregon Dunes National Recreation Area (ODNRA) to the north of the LNG Terminal site. These wells range in depth from 90 to 120 feet below ground surface (bgs), from which non-potable water is withdrawn from the Dune-Sand Aquifer. The closest CBNBWB well to the LNG Terminal site is located approximately 3,500 feet north. Construction and operation of the LNG Terminal site is not anticipated to directly impact the structure of the CBNBWB wells, nor result in saltwater intrusion or iron contamination.

From our examination of information about the Dune-Sand Aquifer, there is a high potential that the land filling road building and excavating activities of the site will affect these wells. The report and modeling by USGS (Jones 1992)[4] of water levels in wells across this aquifer (see Jones's Fig. 21 below) shows the contours of the water table. The general flow of the water table is toward the north and west; the aquifer is highly permeable. The substrate permeability and slopes appear to support that runoff from the site and changes in water flow would likely influence and infiltrate the groundwater and ground water related surface water resources of the spit.

Moreover, industrial wastewater contaminants from prior activities at the site should be carefully considered as these relate to the proposed JCEP and its permit application. In our review of this application, the JCEP apparently fails to address issues relating to the extent and risk posed by previous industrial contamination at the proposed site and neighboring areas. The potential exists for the project's proposed dredging and excavation to expose the surface and groundwater to several subsurface chemical contaminants directly or by altering the hydrology around the site, mobilizing sequestered contamination to move into the aquifer.

[4] Jones, M. A. 1992. Ground-water availability from a dune-sand aquifer near Coos Bay and North Bend, Oregon. U.S.G.S. Open-File Report 90-563.

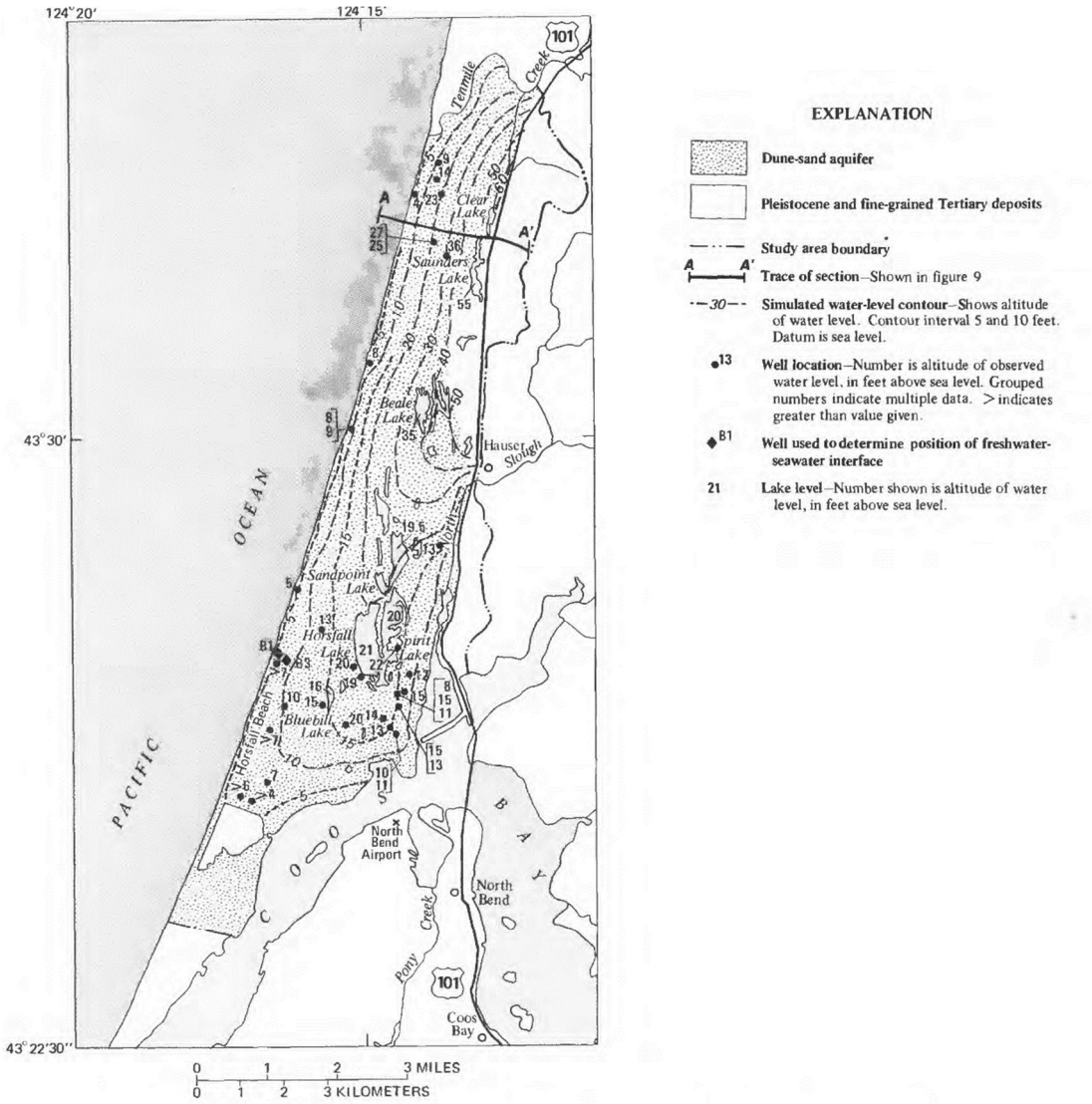


Figure 21.--Average observed water levels in wells and lakes, and contours of the simulated water levels in the upper layer of the model in the dune aquifer for the 1984 water year.

The rights for these wells are guaranteed by the Coos Bay North Bend Water Board.

Negative impacts on groundwater and other drinking water supplies from HDD river crossings. Hydraulic directional drilling (HDD) is planned for several major river crossings and at two locations crossing Coos Bay. The process and hazards with this procedure raise several concerns, including possible jeopardy to drinking water. The consequences of a "frac-out" during HDD in any location can be significant and frac-outs are known to occur relatively frequently.[5] For example, at one proposed HDD site where the Rogue River would be crossed north of Shady Cove OR, the soils are known to

[5] Jessica Dickers, "What is a Frac-out in HDD?," *Utility Magazine*, May 4, 2016; State of Oregon, DEIS comments, 2015, p. 102.

contain mercury and arsenic. If a frac-out were to occur at this crossing, both these naturally occurring toxic substances and drilling pollutants could easily find their way into this critical river. Shady Cove is a community of approximately 3,000 residents, most of whom obtain drinking water from private wells. These wells (and many others along the PCGP route) provide the only source of drinking water to residents. There are an estimated 150 wells within a mile of the planned HDD crossing of the Rogue River. Several hundred residents obtain drinking water from a private water company that takes water from the Rogue to serve its customers. The Rogue River is also the back-up water supply for the City of Medford. Historically, Shady Cove has had challenges with private wells going dry as the population grew. The aquifer into which private wells are drilled has pockets of water that are interconnected in ways that are difficult, if not impossible, to discern. HDD activity that fouls a well in one location could have widespread detrimental effects on wells throughout the system.

Klamath County offers an equally disturbing example of impacts from an HDD frac-out. Below (p. 32), we discuss soil contaminants at the Collins Company site on the banks of the Klamath River and under a mile from the HDD location for the river crossing. DEQ should not consider approving a Section 401 Clean Water Act permit until a thorough investigation of potential interplay between planned activities and known and unknown potential contaminants has been conducted in any case, but especially given the proximity of a planned HDD crossing.

Negative Impact on Drinking Water from Other Pipeline Construction Activities. Other project activities risk unacceptable impairment of drinking water quality and supply, as well. For example, blasting would be a routine procedure for pipeline construction. That activity could potentially disrupt groundwater of all kinds on which landowners and communities along the entire pipeline route rely for domestic drinking water, as well as livestock watering and irrigation. We discuss the further possible disruption of the latter beneficial uses below (p. 12).

Fishing, recreational and commercial. These beneficial uses require access and functional ecosystems that support fish and shellfish populations. Proposed dredging and construction, as well as operation of the Jordan Cove liquefaction facility, terminal, the ship berth operations, ballast discharge and ship traffic related to LNG export would restrict in significant short- and long-term ways all other commercial and recreational water uses including fishing, a public trust right in Oregon.[6] While fishing is a protected beneficial use under OAR 340-041-0300 for the South Coast Watershed, it is doubtful that either fishing, clamming and crabbing or water contact recreation would be able to proceed throughout the construction period at anywhere near pre-project levels.

B. Access for commercial and private recreational water uses including fishing would remain highly restricted during project operations. Security and safety issues must both be expected to result in practical and even regulatory curtailment of Coos Bay and Coos River uses as they currently exist. With disruption of fishing goes a decline in other important values essential to life and the economy in the area.

The significance of fishing as a designated beneficial use includes its economic impact. While several years old, a report sponsored by the Oregon Department of Fish and

[6] *Oregon Shores Conservation Coalition v. Oregon Fish and Wildlife Commission*, 62 Or 481, 493 (1983).

Wildlife (ODFW) provides the following expenditures generated by tourism and recreation related to fishing as follows (in millions of dollars):

South Coast region	Shellfishing $3.5	Fishing	$1.6
Southern region		Fishing	$11.3[7]

It is not surprising that fishing and shellfish-based enterprises in the Coos Bay area are worried about the future if the JCEP is allowed to proceed. James Hampel, owner of Coos Bay Oyster Company, noted in his Motion to Intervene in JCEP's Application to the Federal Energy Regulatory Commission (FERC) that the project would destroy his business.[8] Not only would changes in the construction phase affect commercial oyster production, the risk of ongoing contamination through sediment releases and spills poses a significant risk throughout the operational phase of the project.

The fishing industry's concerns are well-founded. The removal with dredging will disrupt the water quality and the natural ecosystem of the sand/silty benthos of the bay. There are considerable areas near the target sites that are index areas for several species of clams and these populations are part of the monitoring program by ODFW (Fig. 1). They report high densities of cockle, gaper, and littleneck clams. In addition to the mollusks, these areas support beds of eelgrass as shown in Fig. 2 below (p. 8) using data from ODFW in 2014.[9]

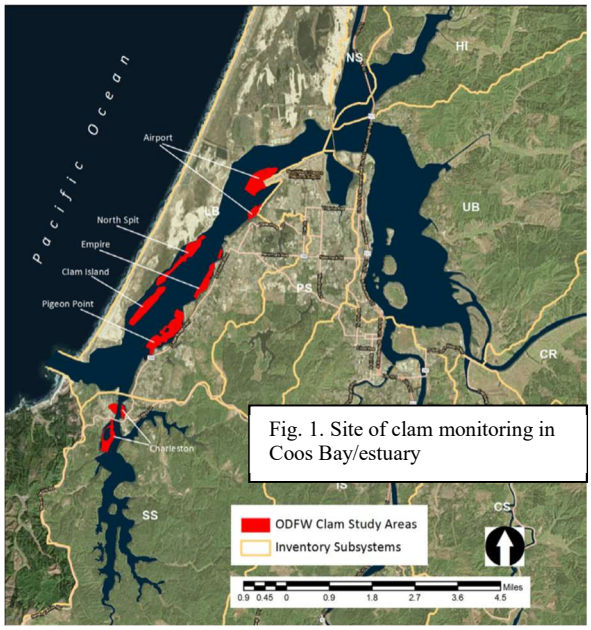


Fig. 1. Site of clam monitoring in Coos Bay/estuary

[7] Dean Runyan Associates *Fishing, Hunting, Wildlife Viewing, and Shellfishing in Oregon 2008: State and County Expenditure Estimates*, May 2009, p. 13.
[8] James Hampel, "Motion to Intervene," February 28, 2015.
[9] Oregon Department of Fish and Wildlife (ODFW), "Status of Oregon bay clam fisheries, stock assessment, and research." [Information Report Series draft June 2014]. Oregon Department of Fish and Wildlife Marine Resources Program, 113 pp.

Fig. 2. Eelgrass distribution in Coos

The eelgrass in the bay would not only be affected with removal of dredge along the Federal Navigation Channel and access for the slip, but increased sediments released through these operations can smother the beds. The eelgrass community is essential biological support for dozens of fish and shellfish at different times in their life cycle. Several extensive scientific literature reviews have documented that the combined effects of losses of eelgrass can be attributed to human-related changes in the ecosystem such as reduced water clarity (turbidity from phytoplankton blooms or increased suspended inorganic matter), mechanical damage (e.g., dredging, filling, propeller scars, anchor chains, aquaculture), sea level rise, and release of toxic chemicals.[10]

The vessels used for dredging are not identified, only the size of the pipeline to transfer the mass.

These proposed dredge areas are associated with recreationally harvested species of crabs (Fig. 3), as well as areas of migration and temporal feeding of fish species and haul out areas for marine mammals.

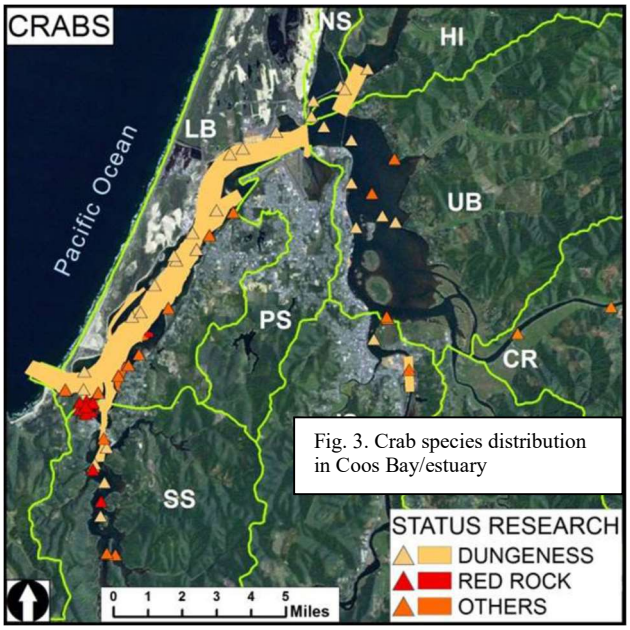


Fig. 3. Crab species distribution in Coos Bay/estuary

Many of the regions that are proposed for dredging are important parts of the food base for fish and wildlife, as well as human harvest. The direct impact of habitat disruption and elimination will be substantial, and the cumulative impacts of creating deep water habitats where there were more shallow beds and sandy shoals are not addressed at all. These shallow areas are used for a variety of fish species, including flatfish and migrating salmonid smolts.

According to the recent documentation provided by the Partnership for Coastal Waters Data Sources in their Chapter 13: Clams and Native Oysters in the Coos Estuary, the

[10] Duarte CM. 2002. The future of seagrass meadows. Environmental Conservation 29(02):192 - 206

area of the mitigation site near the airport is adjacent to an area with native oysters and clams (Fig. 4 below).

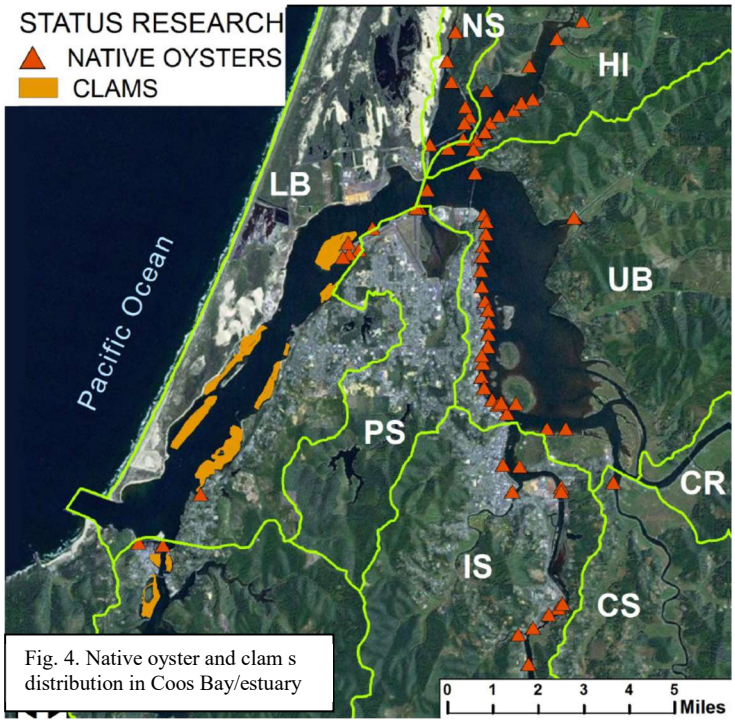


Fig. 4. Native oyster and clam s distribution in Coos Bay/estuary

JCEP pipeline construction activities would impair fishing uses in the Rogue, Umpqua, and Klamath Basins. Disruptive activities include blasting, tree-felling, and other heavy equipment operations along rivers and fishable tributaries. Since the JCEP's plan is to launch and carry out pipeline construction simultaneously in all five "spreads," recreational fishing anywhere in southern Oregon within a miles-wide proximity of the pipeline route will be disrupted, if not impossible, throughout the construction period. In many areas, the aesthetics will be so thoroughly compromised that anglers will no longer find reason to visit those areas again.

Underlying concerns about disruption of fishing as a designated beneficial use are those related to the negative impacts on water quality that would harm fish populations and their habitats. To the extent that fish and other aquatic species are harmed by degradation of the habitat on which they rely for life, JCEP activities indirectly, but definitively, harm the fishing use Oregon's Water Quality Standards are designed to protect.

C. **Fish and aquatic uses.** We believe JCEP activities and operations will negatively impact this designated beneficial use in the various waterbodies that would be impacted by the project. The construction and operation of the terminal and pipeline, including dredging and fill, removal of riparian vegetation, tanker traffic, wastewater discharge, ballast water discharge, pipeline stream and river crossings, and the risk of catastrophic damage due to gas fires or seismic events combine to create unacceptable harm to aquatic life and disruption of this designated beneficial use. Application materials indicate that 64 waterbodies reported to have Endangered Species Act (ESA)

designated species present will be affected,[11] and that project activities will negatively impact water temperature, sedimentation, turbidity, toxicity, and other numeric criteria of Oregon's Water Quality Standards.[12]

The Corps and DEQ in their "Public Notice" stated that "preliminary review indicates the described activity may affect threatened or endangered species or their designated critical habitat" (p. 12). The presence of federally protected species in the area of impact will require consultation with federal partners, as well as Indian tribes. The JCEP project will disrupt the critical habitat of federally protected aquatic species, including Coho Salmon (*Oncorhynchus kisutch*) and Green Sturgeon (*Acipenser medirostris*).

Coos Bay is considered part of the critical habitat for the threatened distinct population of Green Sturgeon and provides important summer habitat for subadult and adult Green Sturgeon. According to the National Oceanic and Atmospheric Administration (NOAA) plan for recovery of Sturgeon, "Road building (resulting in sedimentation), a proposed liquefied natural gas (LNG) project, dredging, urbanization (resulting in pollution and increased peak flows), commercial shipping, stream channelization, wetland filling and draining, and development and silviculture (resulting in the loss of large woody debris and forested land cover) . . . . " are threats to recovery.[13]

Indian Tribes, NOAA fisheries, and the State of Oregon have worked hard to restore the salmon populations in the south coast. The State has invested significant amounts of Oregon taxpayer money to restore water quality and salmon in all six of the sub-basins that would be affected by the JCEP—the Coos, Coquille, South Umpqua, Upper Rogue, Upper Klamath, and Lost River sub-basins. The Western Environmental Law Center (WELC) determined total expenditures by the Oregon Watershed Enhancement Board (OWEB) of over $37 million.[14] The *ESA Coho Salmon Recovery Plan* produced by NOAA National Marine Fisheries Service outlines major threats,

> Degraded water quality, reduced water quality, including high water temperatures, and increased fine sediment levels affect Coho Salmon production in several populations. Increased water temperature is the primary source of water quality impairment for Oregon Coast Coho Salmon, and rising water temperatures due to climate change could add to this problem. Land use activities have contributed to increased water temperatures in coastal streams by removing riparian vegetation, disconnecting streams from floodplains, and reducing streamflow through water diversions.[15]

The LWV of Umpqua Valley conducted a study of water issues on the Umpqua River in 2009.[16] The South Umpqua River is one of the nearly 500 waterways that would be impacted by the PCGP. The League found that over the last 100 years of forest management of both private and public lands, the South Umpqua River riparian zones have been severely degraded. The Umpqua is one of Oregon's most important

[11] JPA, Part 2, Appendix 3/Table B. 3-4.
[12] JPA, Part 2, Appendix A, (page numbers illegible).
[13] NOAA National Marine Fisheries Service Final Green Sturgeon Critical Habitat Biological Report – September 2009.
[14] WELC Scoping Comments.
[15] NOAA National Marine Fisheries Service, *ESA Coho Salmon Recovery Plan*, p. 6.
[16] League of Women Voters of Umpqua Valley, *Local Water Study, Phase One Report,* June 2009.

producers of Spring Chinook, Fall Chinook, Winter and Summer Steelhead, Coho, and sea-run Cutthroat Trout. The Umpqua system accounts for more total and wild Coho spawners than any other river system in Oregon and about 15% of Coho spawners coast-wide.[17] Anadromous fish, such as Coho and Chinook Salmon and Steelhead (and resident Rainbow and Cutthroat) Trout, swim, feed and spawn in the rivers and streams of the Umpqua National Forest. In the 1930s, the entire South Umpqua watershed was inventoried, and the results illustrate significant changes over time to present conditions. Historically, the South Umpqua was a larger producer of salmon than the North Umpqua. By the time of the study in 2009, the South Umpqua was too warm to support salmon in the summer. Coho, once abundant there, had declined significantly. Juvenile salmon spend two to three years in their natal streams before migrating to the ocean. Juvenile salmon must have adequate stream flows and acceptable quality of fresh water.[18] Any construction associated with the PCGP in the South Umpqua River basin will almost certainly further degrade this already at-risk river and watershed and place the fish in even greater jeopardy.

D. Wildlife and hunting. ODFW has articulated on many occasions its numerous concerns about detrimental potential impacts of the JCEP to fish and wildlife. In its segment of the State of Oregon's Scoping Comment to FERC last fall, ODFW provided a list of issues related to various species of fish, mule deer, elk, and wolves and described its responsibilities and protective plans for each. They mentioned that mitigation plans would likely be needed for many issues (a practice we find troubling and will discuss below). However, we note ODFW's unique approach to potential negative impacts to Category 1 habitats. These are defined as, "coniferous old growth and late successional forest (a portion of this acreage with spotted owl and marbled murrelet use); vernal pool wetlands; mature oak woodlands; and rare plant habitat." Citing "The Fish and Wildlife Habitat Mitigation Policy," ODFW states, "The Department shall act to protect Category 1 habitats described in this subsection by recommending: (A) *avoidance* of impacts through alternatives to the proposed development action; or (B) *no authorization of the proposed development action if impacts cannot be avoided* [emphasis added]."[19] We find it especially disturbing in light of this ODFW advisory that the Applicant asks that construction-window requirements for various MAMU-stands be waived during pipeline construction.[20]

In the same 2009 ODFW Report on mentioned above (p. 7), the following expenditures related to hunting and wildlife viewing indicate the economic significance of these two designated beneficial uses (in millions of dollars):

South Coast region	Hunting	$1.3	Wildlife Viewing	$1.9
Southern region	Hunting	$5.6	Wildlife Viewing	$4.2[21]

E. Navigation/boating. If constructed, the enormity and unique needs of an LNG export operation of this nature can be expected to take precedence over all other uses of the channel. The only two LNG export facilities in use in the USA are located in areas with

[17] *Partnership for the Umpqua Rivers Action Plan,* June 2007, p. 3.
[18] LWVUV, p. 6.
[19] Ellen F. Rosenblum, Oregon Department of Justice to Kimberly D. Bose, Federal Energy Regulatory Commission, August 15, 2017, pp. 11-34.
[20] JPA, Part 2, Appendix 3, Table B. 3-4.
[21] Dean Runyon and Associates.

easy marine access and wide channels, and that are not in close proximity to structures such as airports, hospitals, schools, and other structures. Navigation in and around the project facilities in the Coos Bay by all other users will necessarily be curtailed and disrupted to make way for the tanker and facility operations. The Port of Coos Bay hosts several forest product export facilities that use bulk carriers to move forest products such as chips and logs out of the bay throughout the year. These carriers are much smaller than those proposed as LNG carriers. In addition, numerous recreational trips are provided on a range of vessels, including the historic Tall Ships, *Lady Washington* and *Hawaiian Chieftain*, that visit frequently for extensive tourist opportunities including adventure and evening sails and special events in the bay. In addition to these boating and shipping uses, the fishing fleets stationed in Charleston will be using the same entrance to the bay, and the operations in Charleston Harbor are a highly important part of commercial and recreational fishing, boating, and charter activities in the state. Seafood processors in Charleston are dependent on the regional fishing fleets access to dock areas, and delays in passage due to LNG tanker activity could affect their schedules and successful business operations.

F. Water contact recreation. Water contact recreation is a critical component of southern Oregon's economy and lifestyle. Including recreation as a designated beneficial use in the state's Water Quality Standards attests to this reality. Communities near the major rivers that would be impacted by the JCEP from the Coast to Malin enjoy and rely on various non-fishing aquatic recreation including rafting, kayaking, canoeing, and swimming. Project activities at least during construction appear highly likely to disrupt this designated use and we see no realistic means of mitigating location-specific harm.

G. Irrigation and livestock watering. Agricultural use of water is a concern for many landowners along the pipeline route. Bill Gow, a landowner and rancher in Douglas County, filed a comment with FERC dated 2/2/2015. Therein, he stated that he had been offered $14,000 by the PCGP in exchange for disrupting his lifelong ranching operation and diminishing the future prospects for his heirs. Irrigation and stockwatering are central to his ranching activities. Dredging and blasting could potentially disrupt groundwater of all kinds on which landowners and communities within impacted water systems along the pipeline route rely for domestic drinking water, livestock watering, and irrigation. It is disturbing to contemplate what recourse Mr. Gow and other agriculturalists would have if the project were to go forward and their water sources were disrupted. The Applicant states in its Groundwater Monitoring and Mitigation Plan that, "Should it be determined after construction that there has been an impact on groundwater supply (either yield or quality), PCGP will work with the landowner to ensure a temporary supply of water, and if determined necessary, PCGP will replace a permanent water supply." The disruption of any water user's water supply is a serious matter, but while this solution may possibly serve for something the scale of a domestic well or spring, it would fall far short for the volumes and timeliness needed for agricultural uses. It does not appear that the Applicant has considered or made plans for such an eventuality.

II. Designated beneficial uses that would be impaired by JCEP activities are protected by Oregon's Antidegradation Policy.

Oregon's Antidegradation policy (OAR 340-041-0004) has as its purpose, "to guide decisions that affect water quality to prevent unnecessary further degradation from new or increased point and nonpoint sources of pollution, and to protect, maintain, and enhance existing surface water quality *to ensure the full protection of all existing beneficial uses* [emphasis added]." We cannot

feel comfortable that the Applicant's numerous, generally poorly supported, assertions that their activities will not harm Oregon's water or disrupt its designated beneficial uses provide DEQ with the assurance needed to grant the Section 401 permit.

For example, the JCEP application states: "In keeping with the intent of ODEQ's Antidegradation policy, construction and operation of the Project are not anticipated to result in degradation of water quality in Coos Bay, its tributaries or Waters of the State."[22] From the many shortcomings that appear to be in the application package, that is an unsupported assumption!

JCEP's application provides a list of potential impacts to water quality, but barely addresses the potential for toxic substances from prior industrial activities to be released directly by excavation or dredging of the slip and access channel, or by movement of sequestered contaminants in groundwater to areas being excavated. It was stated that "BMPs [Best Management Practices] will be implemented across the Project to prevent pollutants from entering water bodies." And later on, when addressing anticipated impacts at another area involved in the application, the Applicant states, "Additionally, there are known areas of contamination in the bottom of the former Kentuck Golf Course irrigation sump pond. Further delineation work will be performed by JCEP at both the South Dunes and Kentuck Sites to further characterize the areas of contamination and develop an ODEQ-approved disposal plan that will remove existing contaminated soils and prevent further contamination of the site." By comparison, it should not be overlooked that no such thoroughgoing attention or methodology is promised by JCEP to address a potentially far greater release of toxic contamination still posed by the nearby sites of a 30-acre aeration settling basin and former 230-acre wastewater treatment lagoon.

Additional Anti-degradation concerns are related to the eelgrass communities.

The Applicant may argue that Section 401 Certification should be granted because these significant violations of Oregon's Water Quality Standards associated with construction are temporary, but our understanding of Oregon's Antidegration Policy (OAR 340-041-0004) would not allow for exemption as described in OAR 340-041-0004(5).

III. From what is known of the Applicant's proposed activities and operations, we do not believe JCEP has provided reasonable assurance that Oregon's <u>numeric criteria</u> will be protected.

To comply with this requirement for Section 401 Certification, the Applicant must identify all waterways (including tributaries, wetlands and other waters, and groundwater) and provide the current status and condition in accordance with actual information, in terms of sedimentation, turbidity, toxic pollutants, dissolved oxygen, pH, temperature, and other numeric criteria specified in Oregon's Water Quality Standards. Full description of all project activities, both short- and long-term, that can be expected to have impacts on any of the numeric criteria must be identified, disclosed, and then well-developed plan demonstrating how violation of those criteria will be avoided must be presented. Frequently, the Applicant falls short, including by simply claiming that they do not anticipate problematic results from project activities and, should issues arise, they will employ "Best Management Practices."

[22] Part 1 401, Water Quality Certification Memo, p. 13.

Numeric Criteria Issues, General

A. Potential for unacceptable introduction of bacteria (OAR 340-041-0009). The potential for bacterial contamination of the water would be most likely to occur during construction, as septic drain fields could be disturbed. Agricultural uses may also be exposed to runoff from storm events that normally would be cancelled by stream buffers.

B. Potential for unacceptable levels of dissolved oxygen. We find that the activities and operations of the JCEP would likely result in reductions in dissolved oxygen levels below minimums established in OAR 340-041-0016(1)-(6). Minimums vary depending on several factors, as do conditions that can cause reduced dissolved oxygen. We will address two examples.

Dredging is a central activity in many aspects of the proposed project. The project proposes to remove by dredge and dewater a volume of 4.3 million cubic yards of wet sediments with the construction of the proposed navigation access channel and deep draft vessel berths. The volume of wet sediments to be dredged and pumped from four proposed Navigation Reliability Improvement dredge areas adjacent to the federal navigation channel to the APCO #1 and #2 dewatering and disposal areas is estimated to be 700,000 cubic yards. In this setting, dredging will lower dissolved oxygen by activating organic materials in sediments. With regard to this issue, DEQ noted the need to measure "Total organic carbon, acid volatile sulfides, and nutrients" to determine their impact on "oxygen levels caused by the resuspension of sediments during dredging activities."[23] We have not seen in application materials that this has been done.

Dredging in conjunction with river and tributary crossings along the pipeline route may also be a factor. To the extent that it occurs in active spawning areas, harm to fry would result. We question whether the Applicant has provided adequate information for DEQ to be able to determine with certainty that activities would not result in oxygen reduction.

C. Potential for unacceptable increases in temperature levels. We discussed above in the section on the designated beneficial water use of "Fish and Aquatic Species" (pp. 9-10) several concerns about the potential for the JCEP to harm fish through activities that would increase water temperatures. Notably, Oregon's temperature standards are based on protecting and restoring our salmon. OAR 340-041-0028(1) states that,

> Water temperatures affect the biological cycles of aquatic species and are a critical factor in maintaining and restoring healthy salmonid populations throughout the State. Water temperatures are influenced by solar radiation, stream shade, ambient air temperatures, channel morphology, groundwater inflows, and stream velocity, volume, and flow. Surface water temperatures may also be warmed by anthropogenic activities such as discharging heated water, changing stream width or depth, reducing stream shading, and water withdrawals.

[23] State of Oregon, Department of Environmental Quality, DEIS comments, 2015, p. 42.

JCEP's project design—for both construction, operation and maintenance—makes the following provision in OAR 340-041-0028 especially applicable to the JCEP Section 401 application:

> (2) Policy. It is the policy of the [Environmental Quality] Commission to *protect aquatic ecosystems from adverse warming and cooling caused by anthropogenic activities* [emphasis added]. The Commission intends to minimize the risk to cold-water aquatic ecosystems from anthropogenic warming, to encourage the restoration and protection of critical aquatic habitat, and to control extremes in temperature fluctuations due to anthropogenic activities. The Commission recognizes that some of the State's waters, in their natural condition, will not provide optimal thermal conditions at all places and at all times that salmonid use occurs. Therefore, it is especially important to minimize additional warming due to anthropogenic sources. In addition, the Commission acknowledges that control technologies, best management practices and other measures to reduce anthropogenic warming are evolving and that the implementation to meet these criteria will be an iterative process.

The JCEP proposes multiple anthropogenic activities that would almost certainly increase temperature in critical waterways of the state.

Shade removal and its warming effects. The PCGP will involve clearcutting a 95-foot-wide swath through approximately 142 miles of forested lands for the pipeline right-of-way, as well as for an unspecified total area for temporary extra work areas (TEWAs) and contractor, pipe, or offload areas and upland vegetation.[24] The applicants claim that most of these activities will have only a temporary effect, despite the fact that the pipeline construction period involves a two-year period of tree-felling and pipeline construction. But the impact doesn't stop there. Ongoing a 50-foot-wide swath will be maintained vegetation-free for pipeline maintenance, ensuring that the majority of the shade removal impacts will persist for the life of the project.[25]

Channel alteration and its warming effects. Loading of tankers and associated cooling waters released during loading and transit is an area not well covered in a comprehensive evaluation. The Applicants acknowledge that a plume of elevated temperature from the LNG transport ships berthed during loading will release heated discharge up to a 2.8°C elevation over intake temperatures. The models of the dynamics of the heated effluent from ships illustrated figures of the Regulatory Mixing Zone for a series of scenarios and two types of ships. The applicant's model of effluent plume shape and extent from the ship to reach a proposed level of marine accepted thermal elevation of 0.3°C. However, this study does not consider that the pumping rates for the ships during the 24-plus-hour residence time in the slip will be substantial, and that the tidal flux may not be adequate to maintain the intake temperatures assumed for intake in their model. What about the likelihood that the intake temperature rises due to the nature of the confined space? We question why this model approach does not look at the cumulative effect of more than one day residence in this confined area. We provide more

[24] JPA, Part 2, Appendix E.6, p. 1. [fix footnote to fit placement in comment]; "Public Notice," p. 8.
[25] JPA, Part 2, Appendix A,

comments about the assumptions of the various models provided in the assessment of operations below.

Removal of surface or groundwater for hydrostatic testing and the warming effects of that activity. It does not seem acceptable or consistent with the thrust and specifics of the state's numeric Water Quality Standard for temperature to allow the withdrawal of large volumes of water from surface water in the vicinity of the pipeline for hydrostatic testing. It seems likely that reductions in water volume of source surface waters would consequently be elevated by reduced flow rates. We are glad to see that ODFW is involved in the review of the hydrostatic testing plan. We read in the application that the process proposed has been proven to avoid the entrainment of fish. We hope we can accept that as a guarantee because the late summer/fall timing for this project activity will place it in the sensitive spawning period when large numbers of fish will be clogging streams and rivers. But we believe DEQ must look very carefully at the impact of this proposed process on water temperature increase in light of the various state standards concerned with that factor.

Increased risk of wildfire and its temporary and permanent warming effects. The substantial increase in human and equipment activity in heavily timbered areas during pipeline construction can by itself be expected to increase the risk of fire. Sixty-two percent of the pipeline route is forested. As the Public Notice indicates, the PCGP plans to construct 229 miles of pipeline simultaneously in five sectors. For various reasons, the Applicant indicates that pipeline construction would take place during the "dry season," apart from some areas of Klamath County where the Applicant has stated in some places that they have agreed to construction during the winter months to avoid disrupting irrigation practices. In an average year in southern Oregon, that would put the construction phase for the bulk of the pipeline from mid-May or early June through October. However, the Applicant has committed to avoid construction activities in certain areas along the pipeline route during critical bird nesting and other wildlife protection periods. That would push the construction period even further into the summer. It seems unavoidable to conclude that, in order to meet company timelines and stay within budget, pipeline construction—involving the use of feller-bunchers, chainsaws, bull-dozers, track-hoes, and other heavy equipment, as well as blasting—would need to take place across four southern Oregon counties during the several months with high to extreme wildfire risk conditions. Wildfire season is coming earlier and lasting longer, and fires are becoming more intense and destructive. We find it alarming to contemplate what this could lead to and discussed this further in our July 20, 2018 comment. To the extent that wildfire would occur as a direct result of JCEP activities, the temporary and permanent warming of waterbodies caused by fire and additional removal of vegetative covering would be a very predictable violation of Oregon's Water Quality Standards (WQS) for temperature.

D. Potential for unacceptable increases in turbidity (OAR 340-041-0036). This WQS sets a limit: "No more than a ten percent cumulative increase in natural stream turbidities may be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity," but opens the door to exceedance by "limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted." The Applicant must—and does—

acknowledge that numerous project activities will increase turbidity in all impacted waters of the state, but in each case, they state that they are eligible for receipt of the Section 401 Certification because they will provide "all practicable turbidity controls techniques." Our study of JPA materials causes us to question this assurance, primarily because they do not appear to have considered adequately the extent of project activities that will cause exceedance. In some cases, they understate the potential for such exceedance to occur. Here are two examples.

Turbidity from dredging in Coos Bay. With the extent of the dredging operations in Coos Bay, and placement of spoils at several sites in the Coos Bay area, turbidity will be associated with the operations. The Applicant provides a model of turbidity in affected areas and discusses likely effects with a series of assumptions. The Applicant indicates that the dredge will be dried before placement, but the quantity of substrates removed, and the climate of our area appear to not be considered as factors. The Applicant states that all work within the Coos Bay estuary—including construction of the Materials Offloading Facility (MOF), dredging of the access channel and removal of the berm, and dredging associated with the navigation reliability improvements and eelgrass mitigation site—will be performed during the ODFW in-water work window (October 1 to February 15). However, this is the time of the rains in the area, and we question the ability of the Applicant to create dry dredge spoils and successfully dewater to reduce turbidity. The project proposal includes a permanent impact on 15.078 acres of mud flats, 1.9 acres of vegetated shallows for a total of 16.978 acres with a permanent impact that is proposed for their mitigation. The total acreage affected is projected at 90.951, but much of this is considered temporary of which are 58.036 acres subtidal. These subtidal areas are highly likely to produce turbidity.

Turbidity from frac-outs. Deficiencies in JCEP plans for dealing with risks of frac-outs during HDD increase the potential for significant turbidity standard violations. We discuss our concerns with planned use of HDD regarding potential pollution of drinking water above (pp. 5-6) and below (pp. 35-36). In the latter discussion, we note what we believe to be inadequate risk assessment and disclosure, as well as non-specific planning for HDD-related spill containment. We will add here the negative impact of frac-outs on turbidity. We have reviewed the Applicant's "Drilling Fluid Contingency Plan" (Appendix H.2 of Attachment C in Resource Report 2) and find it unsatisfying in terms of acknowledgment of impact and evidence of preparedness. The fact that a major additive to drilling mud, bentonite, is "naturally occurring" does not reduce the potential impact on fish and other aquatic life in the event that hundreds of gallons of tainted mud are released in Coos Bay or the Coos, Rogue, or Klamath Rivers. Another report, "Failure Mode Procedure for the HDD Pipeline Installation Method" (Appendix I.2 of the same attachment) looked promising for detailed analysis and preparation tailored to specific conditions on pertinent water bodies. However, the majority consisted of generic discussion of HDD procedures. GeoEngineers in their assessment reports (Appendix G.2 of Attachment C) admitted that they did not perform any hydraulic fracture analysis (p. 7). One of their primary recommendations was that the Applicant be sure to hire a qualified contractor. Frac-outs are a known risk. Their frequency and difficulty of avoidance is well acknowledged. However, we did not find the caliber of evidence of planning that we believe would allow DEQ to be assured that turbidity-causing frac-outs would be aggressively precluded. Instead, the Applicant seems to assume that impacts would be short-lived and therefore, acceptable.

E. Nuisance Phytoplankton Growth (OAR-041-0019). We suggest that the alteration of landscape and changes in the flows, especially in the area of the slip, elevated temperature and dynamic nutrient and flow regimes could give rise to nuisance phytoplankton blooms. In addition, the wetland areas of the North Spit should be explored for consequences of disruption of the ground water flows and potential for developing nutrient related algal blooms. These are not explored at all by the Applicant.

F. pH (OAR 340-041-0021). Aspects of the change of pH are related to removal of anoxic sediments and should be examined as part of the dredging impacts. We provide comments about the potential of toxic metals and other substances to be released with removal of anoxic sediments.

G. Total Dissolved Solids (TDS) (OAR 430-041-0032). The Applicant provides a model for turbidity but the dissolved fraction of this is not part of the assessment. Has the Applicant made assumptions that these fractions are minor, and will be considered in the sediment assessments? More information about the composition of the dredge materials and the mitigation materials and procedures used would be needed to determine if and what particular dissolved solids are components of the releases.

Specific Response to the Summary of Numeric Criteria in Part 1, Appendix, Table 2 Summary

There are substantial concerns related to the potential violation of Oregon's numeric criteria posed by the extensive project activities proposed to take place in and around the Coos Bay and Jordan Cove. The applicant's summary Part 1 Appendix, Table 2 provides a visual 22-item inventory of their assessment of Jordan Cove LNG project impacts regarding numeric water quality criteria. The Applicant comments on their impacts related to many of the numeric regulatory criteria central to Oregon's Water Quality Standards discussed above for emphasis.

We reviewed this assessment summary table and supportive information contained in the Part 1 application documents and have concluded that the Table understates, and in some cases, misrepresents, the potential and likely effects associated with these listed components and their likely impact of these separated water quality parameters. Many of the assessments made by the applicant appear to have failed to consider elements related to the activities. Furthermore, the models provided regarding some of the parameters are singular in their approach and model assumptions and criteria used differ or are not harmonized.

We provide brief comments on the Applicant's judgment of impact to consider the activities detailed in their summary table Part 1 Appendix A, Table 2 with its 22 elements. We provide more complete comments in the section on criteria and also in the critique of models provided on various factors affecting water quality.

1) Placement of permanent infrastructure (upland/in-water piles, bridges, culverts, tide gates). The Applicant indicates no impact on bacteria or water temperature. We see no evidence for their conclusion, especially given the land use in the terrestrial habitats that the project traverses. There are existing agricultural and wildlife use in the Kentuck site and watershed that may introduce target bacteria, and water temperatures likely will be elevated with disruptions of fill and berms, including while placing materials. Construction of culverts, tide

gates and bridges have a likelihood of affecting both temperature and bacterial loading during the placement process. This process is likely to further affect all aspects of water quality, quantity, and biological criteria.

2) Upland site preparation and facilities (construction). The Applicant indicates no impact to bacteria, pH, temperature, or toxic releases. With the proposed upland site preparation for facilities, much of the detail regarding the existing industrial site is presented without covering landfills. There is limited discussion of the risks affecting areas with wells on the North Spit. Placement of spoils and filling is highly likely to release toxic substances. Throughout the area there are loading and storage sites located as staging areas to be used that will add to the complexity of conditions.

3) Stormwater runoff (construction). The Applicant suggests that no biological, dissolved oxygen, pH effect, or groundwater effects are likely. Stormwater runoff commonly has releases that can result in sedimentation that affects dissolved oxygen and can change the pH. The window of work in the estuary during the winter and rainy season will likely exacerbate the risk of stormwater runoff, and the control measures proposed have a history of failing with elevated flows.

4) Stormwater runoff (operation). The Applicant expects bacteria, temperature increases, and TDS. As above, the Applicant similarly indicates that no biocriteria, dissolved oxygen, pH effects are likely. We have no confidence that these conditions will not be affected with stormwater runoff in operation with the limited BMPs that are not adjusted to the magnitude of this project.

5) Fuel and chemical spills (construction). The Applicant claims no effect on bacteria, dissolved oxygen (DO), pH, temperature, dissolved solids or turbidity. Only biocriteria and toxic substances are indicated. However, these spills cannot be considered as unique events, and as they are part of operating construction, certainly events such as storms and activity at the sites can occur increasing the risks of affecting DO and pH. Many components are mentioned as the responsibility of the contractor and their methods chosen. This is too vague, and more specifics are needed to assess these risks and in turn, prescribe control mechanisms.

6) Fuel and chemical spills (operation). The applicant indicates no bacteria, DO, pH, temperature, dissolved solids, or turbidity associated with these spills. However, what happens with a spill during operations and when ship cooling systems are operating, and what are the consequences during storm events? Other effects can be associated with spills besides what the Applicant acknowledges.

7) Hydrostatic testing. The Applicant indicates no bacterial, DO pH, TDS, toxic releases, or turbidity would be associated. What control will they have regarding discharges from testing, and what implications on local site conditions? The quantity of water in testing may be a serious issue regarding water quantity needed, and disposal sites and methodology including testing.

8) Wastewater discharge. The Applicant indicates no effect of wastewater discharge at the terminal site on DO, pH, temp, temp, TDS, Toxicity, or turbidity. This category is vague; statements are not supported with any details. The Applicant indicates that a National Pollutant Discharge Elimination System (NPDES) permit and BMPs to process and treat sanitary waste will meet DEQ requirements, and NPDES discharge requirements, including

utilization of oily water separator and pocket sewage treatment plant, will resolve potential issues.

9) Concrete Batch Plant (Boxcar Hill). The Applicant indicates no effect except for pH. However, operation of the concrete batch plant will entail multiple events and traffic and associated impacts include potential spills, wastes from washing trucks that escape containment structures, safety, and other operations, including aerosols.

10) Slip excavation. The Applicant indicates only an effect on ground water. There are multiple aspects of this process that have effects on the sediments, the movement of dry and wet materials that will likely result in releases and spills, and also potential breaches to the marine environment. Moreover, what potential is there in terms of releases of industrial toxic substances in the sediments and associated area excavated? The change in ground water movement can result in releases to the bay and movement toward other areas of the aquifer, depending on the aspects of the site and operations.

    The extent and depth of excavation and dredging for the Access Channel and Slip for loading and berthing ships could directly introduce demonstrated prior contamination of the site and neighboring lands directly into the Bay. In 1963, many years prior to JCEP's project proposal, a pulp and paper mill was built at Jordan Cove by Menasha Wooden Ware Company (now Menasha Corporation) and operated using a sulfite pulp process. The mill was purchased by Weyerhaeuser Corporation which operated it until 1995 when it ceased pulp mill operations and began making recycled paper. Effluent from the mill was pumped to a 230-acre wastewater treatment lagoon located approximately 0.5 miles from the proposed JCEP operation. An environmental assessment stated that the groundwater quality was slowly improving with time around the lagoon and a 30-acre aeration stabilization basin (later added by Weyerhaeuser) which was associated with the 230-acre lagoon.[26]

    The now disfavored sulfite process of pulp bleaching uses elemental chlorine in bleaching the pulp. It was used at the North Bend mill at least until 1981 and perhaps until 1995. In the process, it also produces highly toxic dioxins, dioxin-like PCBs, furans, and various metals, including mercury, lead, cadmium, and chromium. Dioxins, dioxin-like PCBs, and furans are very persistent in the environment and bio-accumulate in fish, shellfish and waterfowl. The half-life of some of these compounds range from 25-100 years in the environment according to the Environmental Protection Agency's (EPA) website.[27] The wastewater treatment lagoon was used unchanged from 1963-1972, using evaporation and infiltration (dilution, essentially) to reduce the volume of effluent and disburse it into the sand. In 1972, a pipeline was constructed and the effluent pumped from the lagoon to an ocean outfall, possibly reducing environmental exposure of the North Spit to the effluent as detailed by Oregon DEQ[28]

    The massive depth and scale of planned excavation and dredging for the slip could also significantly alter localized hydrology, effectively mobilizing sequestered toxic contaminants not directly located at excavation or dredging sites. The JCEP stated in its application: "Construction of permanent infrastructure and ground improvements have the potential to

[26] Coffan et al. 2008. Conservation prospectus and environmental review: Weyerhaeuser settling pond site, Coos Bay, OR. Cape Arago Audubon and Katalyst, Inc.
[27] https://www.epa.gov/international-cooperation/persistent-organic-pollutants-global-issue-global-response
[28] 2006 Environmental Cleanup Site Information (ECSI) Database Site Summary Report—Details for Site ID 4704, Weyerhaeuser Ingram Yard.

mobilize contaminants into groundwater and spills or leaks could also impact groundwater." That statement was being applied to very limited, known on-site spills or deposits, not recognizing or addressing the possible impact of larger nearby sources of contaminants. It is reasonable that contaminants still present on JCEP property or nearby properties, including the nearby pulp mill wastewater treatment lagoon and aeration stabilization basin, could move readily in groundwater under the same type of conditions. Such contaminants could include the previously mentioned toxic, persistent, and bio-accumulating pollutants. The hydrology studies of the North Spit also support that possibility, since generally, groundwater moves north to south down the center of the North Spit, but also east toward the waters of Coos Bay and west toward the ocean coastline.

The JCEP application notes that the groundwater elevation within the JCEP project area ranges from 1-18 feet, fluctuating tidally and seasonally. As shown in the USGS study and model (Jones 1992 cited above, p. 4), when the groundwater level is seasonally high on the North Spit, it appears obvious that an influx of groundwater could be especially significant in areas of dredging and excavation—especially for the slip with a depth exceeding 40 feet—to produce the mobilization of contaminants through lateral and vertical movement of groundwater. Even with the JCEP plan to use sheet piling (as a cofferdam) in construction of the slip, dewatering the slip worksite of potentially contaminated groundwater without harm to water quality in Coos Bay could pose serious questions. JCEP appears to have presented insufficient data and planned actions to demonstrate that they will seriously address how the proposed project will prevent exacerbating prior industrial contamination or what the possible impact of that might be on water quality in Coos Bay.

In addition, waterborne contaminants tend to move extensively and rapidly (up to several feet/day in groundwater) in highly permeable aquifers composed of such materials as sand. Contamination plumes move downward, reach the water table and then move more laterally.[29]

11) Dredging. The Applicant indicates the only effects of dredging are on biocriteria and TDS but ignores the effects of this operation on the release of toxic substances, changes in pH and dissolved Oxygen, and also possibly impacts on groundwater channels within the basin. Concerns about dredging are covered in many places in our comments including above and below.

12) Dredge spoil disposal and dewatering/decanting. The Applicant considers only effects on turbidity with this process, but the likely effects with stormwater events and the laying of dredge spoil into mitigation sites has the potential of multiple impacts on biota as well as pH, and other conditions. The window for dredging coincides with the fall/winter wet season in the bay and will likely be an important factor affecting the effectiveness and risk mitigation and management of the dredge spoil.

13) Aquatic vegetation removal. The Applicant considers only biocriteria as an impact from aquatic vegetation removal at materials offloading and the slip and access channel. There are many other areas where this process of vegetation removal will be initiated in the project, especially with the proposed federal navigation channel and wetlands alterations. The limitation of assessment of impact to only these areas fails to consider vegetation removal at other sites including at the proposed eelgrass mitigation site and the Kentuck

[29] USEPA 1978. Surface impoundments and their effects on groundwater quality in the United States. US EPA Office of drinking water state programs division.

site. The consequences of vegetation removal at the materials offloading location can result in destabilization of the surface of the sites during storm events.

14) Placement of fill waterward of HMT [highest measured tides] (other than piles). The Applicant accepts that the biological, TDS, and turbidity will be impacts in the placement of fill waterward of highest measured tides (10.26 feet). However, this activity can most certainly affect other aspects, including release of toxic compounds that may be part of the fill from excavation and dredging. The terminal and site have historical industrial uses that resulted in a suite of toxic chemicals remaining in substrates of the area.

15) Temporary dredge line and dredge transfer line. The Applicant accepts that the biological, TDS, and turbidity will be impacts in the placement of temporary dredge lines and dredge transfer lines. The complex nature of the dredge lines and transfer poses risks of toxicity from releases from pumping equipment fuels and components, as well as risks of erosion at sites that may affect the local site water temperatures. We have already commented that placement of the dredge lines can affect marine mammal haul out areas, as well as areas actively used for shellfish harvest, and recreation.

16) Breaching dike at Kentuck Site. The Applicant accepts that the activity will affect dissolved O2, TDS, and turbidity. Additional likely effects include potential for changes in pH with release of sediments. In addition, localized effects on biological support will likely be affected with this activity.

17) Construction staging, temporary equipment laydown (includes parking lots). The staging area including temporary equipment laydown areas are extensive in this project. There may be associate effects to the vegetation, compaction of land, and traditional use patterns for these sites, in addition to the potential for introduction of toxic releases and turbidity. There are several areas along the bay that are illustrated to be equipment laydown areas. The traffic in and out of these is of concern, as well as their condition during the rainy season.

18) Operation of construction vehicles and equipment. Operation of construction vehicles could affect the aquifer and water quality, and the movement throughout the area could also release aerosols that could affect water quality. The Applicant reports that the effects of toxicity and turbidity are mitigated by BMPs. What assurance is provided for these plans?

19) LNG vessel transit in estuarine and marine analysis areas. For the LNG vessel transit in operations the Applicant assumes that biocriteria, toxic releases, and turbidity are effects. However, the various Hydrodynamic Technical Memoranda (Project-wide Hydrodynamic Analysis, Prop Wash Analysis, Vessel Wake Impacts, Turbidity Analysis), Vessel Spill Prevention and Response Plans, BMPs, and compliance with speed/operational restrictions are all part of this assessment. We comment on these models below but urge the regulators to consider and require the Applicant to address the complex interaction of these effects on the physical and biological community, as well as impacts on beneficial uses of the bay and its attributes. The physical challenge of moving vessels from 900 to 1000 feet in length, with propellers that can each be nearly 27-foot diameter and accompanied by multiple tugboats dwarfs any other vessel transit in the estuarine environment. The comments we make on model of wake and prop wash consider these, but the displacement and movement in the narrow channels of the bay must be modeled all along the corridor with potential scenarios of conflict from other vessels and recreational and other wildlife uses.

20) Ballast water discharge. The Applicant considers the broad issue of affecting biocriteria and temperature with the ballast water discharge. However, there are no models or discussions of ballast water in the permit applications, nor any discussion of the influence of ballast releases on the salinity, flows, or other components. Of great concern to this project is the combination of temperature effects, and ballast discharge with potential live organisms released or residing in the highly altered habitat post-dredging and during construction. The conditions in the slip and in the access channel will be essentially vacant substrate as a result of the development of the project. What are the risks of the potential release and colonization of non-indigenous organisms (bacteria, virus, algae, invertebrates, vertebrate eggs) in this newly created and highly altered disturbed habitat, thus creating a new opportunity for invasive species. Moreover, the frequency of ships' visitation and the size of ballast systems will provide intense propagule pressure that has not been a factor in this area before.

    From all detected non-indigenous marine species (NIMS) of all major animal, plant and algal phyla, macroalgae not only constitute a large component of the globally introduced biota, but also cause significant economic and environmental damage over which we have only limited post-invasion control and management options, as opposed to introductions in more isolated situations. Commercial shipping is an important invasion vector, making ports and harbors among the most vulnerable environments to biological invasions.

21) Cooling water intake and discharge. The Applicant indicates that biocriteria, and temperature will be affected by the cooling water intake and discharge. We provide a separate section in our comments with additional critiques of the model developments provided in the application as memoranda of the Part 1 application regarding the Coos Bay and terminal effects. But the assumption that biocriteria and temperature releases from cooling water intake and discharge in this slip are devoid of effects on salinity, flow dynamics, and turbidity is naive. The models provided by the Applicant consider two existing cooling systems used in ships during loading process, and do not consider the effects of these releases on the dynamics in the adjacent area from continuous use for days at a time. Where are the data sources to support the features that are provided? Moreover, the alteration of habitat features in the slip as a result of the repeated and frequent arrival and departure of these ships will have the opportunity to change the structural and biological habitat features, allowing colonization of exotic species that may provide other consequences in the area. Please see p. 28 below for further discussion of invasive species.

    According to the model studies provided, the ambient water in the slip is non-stratified during summer with the salinity of seawater (O'Neill 2014). The RMZ extent was investigated for an ambient temperature of 8°C to represent the lower limit temperature during winter. In addition, the representative winter stream flow stratification impact on the RMZ extent was modeled with a stratified condition of 25 ppm salinity at the bottom, linearly decreasing to 8 ppm at the surface, with ambient temperature of 10°C, based on the field measured values in February 2014 (O'Neill 2014).

22) In-water work associated with road widening. The Applicant provides overview that the road widening at Kentuck and the Trans-Pacific Parkway/Highway 101 Improvements will be mitigated and minimized and assured by the Erosion Sediment and Control Plan (ESCP), Construction Spill Prevention Control and Countermeasure Plan (SPCCP), Joint Permit Application/Biological Assessment (JPA/BA) avoidance and minimization measures for in-water work These are incomplete plans and provide inadequate assurance as to what will be provided. The in-water work windows are during a time of October 1st to February 15th.

We question that the Applicant has not considered adequately the use of sheet pile containment systems and turbidity curtains to hold and contain sediments and associated spills during the winter windows.

IV. From what is known of the Applicant's proposed activities and operations, it is not possible to have reasonable assurance that Oregon's narrative criteria will be met.

Narrative criteria included in the state's Water Quality Standards appear to be designed to articulate a goal essential to protect our waters and base evaluative considerations on a higher-level view than is facilitated or achievable through numeric criteria even though numeric criteria are often also involved and must be considered. With that in mind, we offer more extensive discussions on several aspects of the JCEP we believe would jeopardize Oregon's water resources unacceptably.

A. The overall deleterious impact of dredging and the resulting dynamics of the estuary system and need for a combined model approach to understand potential impacts.

In discussing this area of concern, the Oregon WQS we are primarily referring to is OAR 340-041-0007(1):

> Highest and best practicable treatment. Notwithstanding the water quality standards contained in this Division, the highest and best practicable treatment and/or control of wastes, activities, and flows must in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels.

We believe DEQ cannot be assured from information in the JPA that JCEP would not violate the sense and purpose of this narrative criteria, as well as the named numeric criteria.

In the Coos Bay and associated estuarine system, a complex habitat exists that is dynamic throughout the season and over the years. The proposed extensive area of excavation for the berth and associated channel modifications to the entrance and to the existing Federal Navigation Channel will result in removal of more than 4.3 million CY wet sediments. The project proposes to dredge the slip and access channel to a depth of 45.2 feet with a 1.7 foot over dredge allowance (46.9 feet). The process of removing this material will expose previously trapped sediments and mobilize potential contaminants from the nearby industrial areas and from the bay area that have been trapped for many years from industrial activities years ago. The release of dredging in polluted estuarine areas can trigger particle surface reactions, in particular, oxidation of metal sulphides and other metals, and the release of these cations into the water column have been documented in many estuaries that have been dredged. The mixing of suspended matter from fluvial and marine origin in the estuarine region can induce very complicated biological and/or physiochemical responses. Toxic compounds can become biologically available again and cause direct mortality and poisoning through amplification in the food chain. Moreover, the actual turbidity of the process will change light penetration and the suspended materials will also be distributed throughout the area depending on tidal and river flows. In estuaries, this process is unique to each region and is affected by the

salinity and water temperatures in each habitat. Modeling the potential of these releases, understanding the window of activity and influence of storm events, river flow rates, and winds is essential in even estimating the potential release and re-distribution of the particles. In estuaries, suspended matter determines habitats and is associated with the food web, especially with benthic organisms. Particles, whether toxic or not, will alter the morphology and affect vertical and lateral suspended matter distribution. There is no reference to any of these components in the permit request.

What effect will the deepening of the channel and areas surrounding the site have on the general dynamics of water flows and transport of suspended sediments downstream and upstream? With greater space for heavy marine water at tidal flux to move upstream, what sort of distribution of the sediments will occur upstream? Several studies of channel deepening have documented this effect. We note the failure of the Applicant to address interactive and cumulative effects with models that combine the outcome of multiple factors, rather than single focus analyses provided as Appendices. We critique these separately below as part of our review.

The Applicant has used different assumptions in models and the models appear inadequate to provide assessments of the estuary and bay's highly dynamic systems both spatially and temporally.

Hydrodynamic Analysis (Part 1, Appendix E). Modeling of hydrology of the area was presented in the hydrodynamic analysis. This model J1-000-MAR-TNT-DEA-00008-00 was a 2-dimensional model project and made with assumption of a limited data set. They presented models "Without-Project" and "With-Project," and the corresponding design features of existing Federal Navigation Channel with a channel depth of -38' Mean Lower Low Water (MLLW) (-37' navigation depth + 1' advance maintenance). The range of scenarios to include a potential deeper channel as requested by the Coos Bay port of the USACE in fall of 2017 was not addressed in this model, although that depth was used in the salinity models provided.

Sediment Transport (Part 1, Appendix H). The modeling of hydrology did not consider sediment and scour but provided separate assessments of sediment transport and deposition modeled using the two-dimensional MIKE-21 Flexible Mesh model, with linked hydrodynamics and sediment transport modules (DHI 2014). Their assumptions for this model were a typical 3-month winter tide cycle (January 1 through March 31, 2011) with a tidal variation between -2.0 and +9.7 feet MLLW to model sediment transport. The sediments modeled were the typical sediments and failed to consider the massive changes in the structures of the slip, access channel, and increase in the federal navigation channel. These proposed alterations are new disturbances and the distribution characteristics should not be assumed to be similar to those before that excavation and activity. The Applicant simulated grain size for their models by making assumptions for other data sets. The calibration for all transport modeling was based on the existing condition bathymetry (OIPCB 2017) and the annual average quantity of maintenance dredging since 1998 (Table 2-1). What sort of transport further up the bay would occur with the increased depth of 45 feet allowing for the wedge of sea water movement with tides with proposed increased channel depth?

Turbidity Analysis (Part 1, Appendix G). The turbidity plume dispersal modeled sediment dispersal during dredging using data from December 19, 2011 and January 2, 2012. The Applicant considered this period as representative of conditions within the in-water work

period, which is from October 1st through February 15th. The Applicant did not provide any justification for use of this period and provided no data set to support this. The actual turbidity plume simulation used data from samples collected in 2005, 2006, and 2010 to simulate grain sizes and characteristics from different tools used. Their models used a cutter suction dredge for capital dredging in the Navigation Reliability Improvements (NRI) areas. A cutter suction dredge has a relatively high production rate, and if appropriately equipped, can dredge the soft rock that will be encountered within NRI 1 and 2. A clamshell dredge was also modeled for capital dredging in the NRI areas (areas 3 and 4). The report does not indicate the proposed dredging equipment and methods to be utilized as it indicated it will depend to a great extent on the selected construction contractor.

Impacts to Salinity (Part 1, Appendix F). The model simulations for salinity were done using a three-dimensional program Visual Plumes and they used the deeper channel proposed by the Coos Bay Port deepened to 45 feet. Comparisons were conducted for a duration of two months in one year, arbitrarily selected from November 16, 2011 to January 19, 2012 to represent typical tidal conditions for which representative steady-state inflow conditions were recorded. Salinity was modeled using the MIKE-3 FM model with linked hydrodynamic and salinity modules. Data for models were from a two-month running average inflow and were analyzed based on available data from the Port for water years 2007 and 2012 according to the report, but no data are provided. The Applicant used one ambient temperature representing the lower winter temperature limit (cases 5 and 6) to considered along with a stratified winter condition (cases 7 and 8). Why with these data sets was such a short period selected for simulations? They conclude that salinity modeling results show that the Port's project to increase the depth of the navigation channel effects both salinity spatial extent and salinity are expected to be very small. Were these values compared to any existing data sets and why use the short two-month period of one year? Moreover, the maps that are produced show the high salinity of 30 and 20 ppt. They show very little information except for a series of slices. What about a more thorough distribution of the salinity? In part 4.4.3, the "High Inflow Scenario," the Applicant provides results for the high inflow scenario in Attachment C. Their model of the worst case shows contour line shift (see Figure C-5 in Attachment C), is less than a mile, and indicate this is minor change from existing conditions. What criteria have they set up to determine the ranking of minor or major changes from these model outputs? How does that relate to the distribution of plankton, benthos, and other species, as well as distribution of sediments. Moreover, the Applicant indicates that this worst-case scenario of continuous high river inflow for two months will be very rare. Again, no data are provided to support this finding or assessment.

Vessel Wake (Part 1, Appendix J). The Applicant examined channel modifications, and to consider the vessel wake on channel configurations described for Without-Project and With-Project. These models assumed that the Federal Navigation Channel depth was -38 feet for with and without project. They used the existing slope for bottom from earlier studies and assumed for the project it would be 3H:1V for sections 103 and 4H:1V for NRI 4. The slip depth was assumed as -45.5 feet.

For this study, they compared a bulk carrier (the largest) with 655.9-foot-long with three different LNG carriers, two spherical and one membrane from 947 to 976 foot long. They used one tug size, approximately 97 foot long. The output, however, was very confusing as the tidal height was low for the simulation of the bulk carrier (1.75 feet) and varying speeds, but the simulation for the LNG ships used departure tides of 4 and 6,

and arrivals at -1 and 4. The tug was modeled for only the -1 departure tide.

This analysis of effects was very confusing and compared scenarios that were not at all similar, and we failed to understand why they used this array to illustrate ship generated waves and drawdowns. Their conclusions of drawdown generated by the LNG carriers for the With-Project condition ranged from about 0.1 – 0.2 ft at the shoreline, while the existing bulk carrier was 0.4 – 0.5 ft drawdown. Their conclusions were that the JCEP will not cause an increase in drawdown in Coos Bay during the LNG carrier's departure and arrival when compared to the existing bulk carrier for the Without-Project condition. We cannot accept this mixed assumption modeling and request further clarification.

Propeller Wash (Part 1, Appendix I). The propeller wash model reveals the largest of vessels to potentially use the slip and Coos Bay area. The dimensions from these models include a tug and ships of the largest size mentioned in the permit documentation. The size of ship modeled is over 1,000 feet and with a 217,000 m^3 capacity as shown in the extracted table from the Appendix I below.

Capacity (m^3)	Storage Type	BHP* MCR**	Twin or Single screw	LOA (feet)	LBP (feet)	Beam (feet)	Molded Depth (feet)	Draft Loaded (feet)	Draft Ballast (feet)	Propeller Diameter (feet)	Height of Propeller Centerline to Keel (feet)
217,000	Membrane	45,300 at 85.5 rpm	Twin	1,034	994	164	89	41	33	26.9	17.1

* British Horsepower

Even though the models assumed that the navigation channel was 38 feet deep, the vessel size provided with loaded draft was 41 feet. These assumptions need to be clarified. To assess potential impacts of propeller wash from vessels and tugs on shoaling and scour in the access channel, slip and MOF areas, two conditions were considered. Their conclusions were that the scour was limited and due to velocities in the unberthing activity.

We request that the Applicant clarify the assumptions and provide more comprehensive models to look at the sequence of events and frequency of ship traffic to better understand propeller wash in light of salinity models, sediment, and turbidity on the environment and water quality and entire transit into and out of the bay.

Cooling Water Discharge (Part 1, Appendix L). The thermal plume analysis considers two types LNG Carriers (LNGC's) likely to call at the terminal. One has steam turbine propulsion (148,00 m^3) and the other dual fuel diesel electric propulsion (170,000 m^3) as discussed in "Cooling Water Flow Rates and Hull Penetration of LNG Vessels Calling at JCLNG Terminal" (JCLNG 2017). These sizes are different from the vessel used for the prop wash analysis, but it is helpful to see the potential vessels described. We suggest there should be clarification of the type of vessel to be calling into port, as the fixed delivery arms of loading likely are designed for a particular size vessel.

Table 2-1 in Appendix L summarizes relevant vessel parameters quoted as follows:

Propulsion	Steam Turbine (ST)	Dual Fuel Diesel Electric (DFDE)
Fully laden draft	11.3 m	11.3 m

Cooling water flow	11,000 m3/hr	3,200 m3/hr
Loading time	24 hours	26 hours
Maximum temperature rise	2.0˚C	2.8˚C
Discharge port diameter	1.80 m	0.55 m
Discharge velocity	1.20 m/s	3.74 m/s
Discharge classification	Low velocity discharge	High velocity discharge
Cooling water discharge depth at fully laden draft	6.6 m	9.3 m
High sea chest intake point above hull baseline	3.0 m	4.2 m

According to the model studies provided, the Applicant assumed that ambient water is non-stratified during summer with the salinity of seawater using data from a study by O'Neill in 2014. The RMZ extent was investigated for an ambient temperature of 8°C to represent the lower limit temperature during winter. In addition, the representative winter stream flow stratification impact on the RMZ extent was modeled with a stratified condition of 25 ppm salinity at the bottom, linearly decreasing to 8 ppm at the surface, with ambient temperature of 10°C, based on the field measured values in February 2014 obtained from O'Neill (2014).[30] The RMZ provided in their assessment considers that the slip mixing is not to be considered. They report that plume behavior determines the boundary of the RMZ at the point where the discharge water temperature is reported to be reduced to 0.3°C above ambient by jet mixing. For their analysis, the 0.3°C above ambient temperature is the baseline water quality parameter that is allowed to be exceeded within the RMZ. There are no details provided for this evaluation to fully understand the assumptions. Moreover the 148,000 to 170,000 m^3 Duel Fuel Diesel Electric DFDE vessels versus Steam Turbine vessels are modeled at constant and stratified conditions, but the true flood and ebb tides are going to affect the 24-hour time frame that the vessels are located in the slips. These models appear inadequate to understand this thermal plume. What effects will be measured as the vessel remains in the slip for 24 hours, and continues to draw in water for cooling? Will there be a climb in ambient temperature as a result of this continuous release? Moreover, the location of the ship release is not part of the model and will likely affect the distribution of the plume. The model results provided in figures appear to show no boundary areas to the plume. As stated previously, the models provided as appendices are presented with different criteria and assumptions, and the outcome of these factors must be combined to assess the likely water quality that can result in different flow rates of the bay, different tides, and wind conditions, as well as the number of ships in the slip that occupy the space.

Additional Discussion of Ballast/Biofouling Risks to the Designated Uses, and Anti-Degradation of the Waterways. In addition to discussions of the risks of ballast water, we add this section to alert regulators of the importance and the risks of exposing the newly prepared habitats resulting from dredging and infrastructure development to the potential colonization from organisms carried in ship ballast and from fouling of surfaces of vessels coming to call in this area. Numerous studies have documented the introduction of non-indigenous marine species (NIMS) of all major animal, plant and algal phyla, macroalgae virus and bacteria have been introduced through commercial shipping operations. Once introduced into public waterways, there are few post-invasion control

[30] O'Neill, M.A. 2014. Seasonal hydrography and hypoxia of Coos Bay, Oregon. Masters Thesis. University of Oregon.

and management options. Furthermore, sediment water retention that is related to sediment size has been reported as another important factor affecting non-indigenous species (NIS) distributions in the Pacific ports studied by DiBacco et al. (2012)[31]. Many common intertidal non-indigenous species including pathogenic virus and bacteria in this region are retained in sediments. Thus, their survivorship could be higher and increase the probability of spreading. Of particular concern to our review is that the creation and operations of this large slip, higher water temperatures from cooling water discharge, mixing from discharge, prop wash, and the general movement of ships and tugs could combine to provide an enhanced opportunity for propagation of non-indigenous organisms that could affect the local resources. This slip area could serve as a point source for further colonization of other areas. Moreover, it is well known that the repeated and frequent discharge of large quantities of ballast from LNG carriers will increase the propagule pressure for any of these events to happen. The need for careful analysis of these multiple factors that can affect the biological resources and existing resource values needs to be addressed by the Applicant.

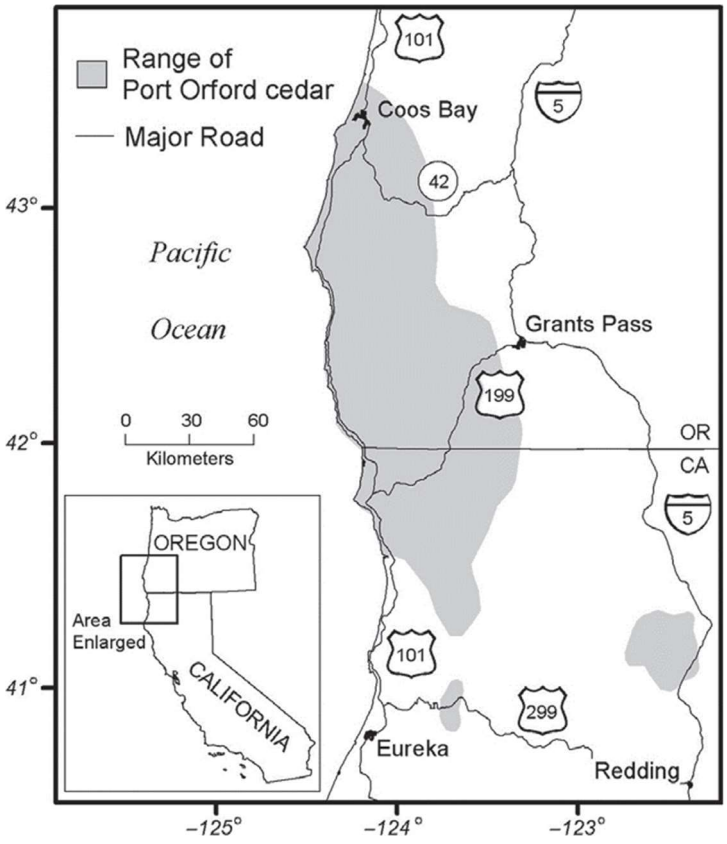
The concerns addressed above would potentially violate Oregon's WQS under at least two regulations: 1) Biocriteria (OAR 340-041-0011): "Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities," and 2) Oregon's Antidegradation Policy at OAR 340-041-0007(10), "The creation of tastes or odors or toxic or other *conditions that are deleterious to fish or other aquatic life* or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed."

B. Additional potential JCEP activities likely to introduce invasive species.

While we understand that the state's Water Quality Standards are not concerned with non-aquatic or vegetative invasive species, we offer the following discussions we believe would be of interest to the current permitting processes of the USACE.

Coastal activities that would open the area to invasion by a variety of organisms. Removal of existing vegetation on land opens the area to invasion by a variety of organisms, and open corridors can enhance dispersal and propagation via many vectors. Of particular concern is the risk of the introduced pathogen affecting the Port Orford Cedar *Chamaecyparis*

[31] DiBacco, C., D. B. Humphrey, L. E Nasmith, and C. D. Levings. 2012. Ballast water transport of non-indigenous zooplankton to Canadian ports. ICES Journal of Marine Science (2012), 69(3), 483–491.



lawsoniana through stream crossings and activity across the landscape. Port Orford cedar is endemic to the regions affected by the pipeline (Figure left). It is considered a foundation species that plays critical roles in riparian areas and on nutrient-poor soils. A non-native, pathogenic oomycete (*Phytophthora lateralis*) has been spread throughout the range of the cedar causing mortality of the trees. The spread of this pathogen occurs over long distances by vehicles carrying infested soil, primarily along gravel roads that serve areas used for timber harvest and other commercial activities. The spread can occur secondarily resulting from foot traffic. New infestations often begin when infested soil is accidentally deposited alongside a road near a stream crossing and is related to the frequency of cross traffic in stream crossings (Jules et al. 2002).[32] The infestation rates of the native cedar have slowed due to the management of the forest access over the past years due to concerns of threatened species.[33]

The aspect of habitat disturbance is a critical factor affecting resulting erosion, stream turbidity, and open habitat for invasion. The proportion of non-native species is least in the mountain Northwest compared to other North American regions and well over half of the non-native plants in any of the land-cover types examined are disturbance dependent.

Clearcutting a 95-foot-wide pipeline right-of-way over 229 miles would create a fertile opportunity for the influx of invasive species across the extent of the route. The aspect of habitat disturbance is a critical factor affecting resulting erosion, stream turbidity, and open habitat for invasion. The proportion of non-native species is least in the Mountain Northwest compared to other North American regions and well over half of the non-native plants in any of the land-cover types examined are disturbance dependent, a significant and unavoidable condition created by pipeline construction.

The control of invasive species is a required practice for all public land managers. A U.S. Forest Service directive states, “The Executive Order on Invasive Species, signed by the President on February 3, 1999 states that, federal agencies will use relevant programs and authorities to prevent the introduction of invasive species, and not authorize or carry out actions that are likely to cause the introduction or spread of invasive species unless the

[32] Jules, E. S.; Kauffman, M. J.; Ritts, W.; Carroll, A. L., 2002: Spread of an invasive pathogen over a variable landscape: a non-native root rot on Port Orford cedar. Ecology 83, 3167–3181

[33] Jules, E. S., C. M. Steenbock, and A. L. Carroll. 2015. Update on the 35-year expansion of the invasive root pathogen, Phytophthora lateralis, across a landscape of Port Orford cedar (Chamaecyparis lawsoniana) For. Path. 45:165–168.

agency has determined and made public documentation that shows that the benefits of such actions clearly outweigh the potential harm and all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

Construction of this 229-mile, 36-inch pipeline that would require denuding a 95-foot-wide swath of vegetation promises the spread of invasive species. Seneca Jones Timber Company LLC owns 3,600 acres of private forest lands and believes their property and operations will be negatively affected in several ways by the PCGP. They discussed invasive species along with other detrimental consequences in a filing to FERC, "Pipeline corridors quickly become brushy areas with a high level of invasive species, such as scotch broom and blackberries. This project proposes reestablishing the pipeline right-of-way with grass. During the dry season, these grasses and brush varieties can contribute a substantial slash component that will be susceptible to forest fires . . . and will increase the risk to Seneca Jones Timber Company, LLC's forest land. The potential for invasive species to spread to our property requires mitigation to maintaining tree growing sites and increases our operational costs." This discussion by Seneca corroborates our contention that invasive species may proliferate.

C. The JCEP raises the potential violation of two narrative criteria at OAR 340-0342-0007 through activities that involve the potential introduction or release of toxic substances into Oregon's water.

> (1) Notwithstanding the water quality standards contained in this Division, the highest and best practicable treatment and/or control of wastes, activities, and flows must in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, *dissolved chemical substances, toxic materials*, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels.
>
> (10) The creation of tastes or odors or *toxic* or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.

Release of Soil Contaminants. The matter of toxic and contaminated materials that would potentially find their way into the numerous water bodies to be crossed by the PCGP is largely dismissed as insignificant by the Applicant. We contend that their investigation and description of potential contaminants is insufficient. The Applicant acknowledges that contamination exists at some project sites, but claims use of Best Management Practices (BMP) will eliminate significant impacts. As we explain below, our review of project information indicates that they understate, underreport, and under-evaluate numerous potential issues and inadequately describe their response. For that reason alone, we do not believe it is possible to have reasonable assurance that JCEP will not violate Oregon's water quality standards.

"Attachment E: Contaminated Substances Discovery Plan" (of the Section 404 Permit Application for the PCGP) has the stated intent: "to outline practices to protect human health and worker safety and to prevent further contamination in the event of an unanticipated discovery of contaminated soil, water, or groundwater during construction

of the [PCGP]." [34] We have several concerns with the thrust of this document and believe USACE should find reason thereby to deny the 404 Water Quality permit JCEP seeks.

First, although in Attachment E, PCGP purports to have evaluated "sites within construction areas" and "sites in proximity to pipeline project area" by consulting DEQ's Environmental Cleanup Site Information Database (ECSI), they conclude "no risk of impact" for each one. The rationale most often provided is that the areas will only be used as pipe yards. We contend that this approach disregards the realities of how dangerous and harmful contaminants are acted upon by ongoing forces such that they can be released to cause deleterious impacts. Contaminated soils do not suddenly become stable and inert once a construction period is over. If that were the case, why would the EPA and DEQ concern themselves at all with contaminated sites, as long as human activity that created that situation has ceased. In fact, the massive disturbance the construction phase of this project would generate is just the beginning of a potential set of cascading and long-term circumstances that likely will degrade our water quality far into the future. Every hard rainfall that sends water, if not mud, rushing across a clear-cut easement and eroding its way down a steep embankment begins a chapter in the story of how this project would exact an unacceptable cost on the waters of the state and nation. And looking only at the construction phase, we are not assured by the Applicant's promise at 5.0 that, when "unanticipated contaminated soil, water and/or groundwater is encountered during construction . . . . All construction work in the immediate vicinity of areas where hazardous or unknown wastes are encountered will be halted" and a long list of measures will be implemented before construction resumes.[35]

More concerning is that Attachment E is silent on other egregious sites of known contamination in close proximity to the pipeline construction route. Human-induced soil contaminants have been found wherever industrial activity has been done historically. The Applicant has not investigated and reported on the most enduring industry, timber and wood products, beyond the former Weyerhaeuser Containerboard/Mill property in the Jordan Cove area (ECSI Site #1083).

In an Oregon DEQ 2006 Environmental Cleanup Site Information (ECSI) Database Site Summary Report---Details for Site ID 4704, Weyerhaeuser Ingram Yard under heading: "Status of Investigative or Remedial Action", DEQ provided Weyerhaeuser strategy recommendations for their environmental assessment work as part of facility closure. But, surface soils appear to have exclusively been the focus of Weyerhaeuser's assessments and the company "concluded that residual contaminants do not exceed DEQ's acceptable risk levels." Further on in the report, DEQ states: "However, while surface soils at the Ingram Yard Site meet human and ecological screening criteria, they contain low levels of potentially bioaccumulating chemicals and must not be placed in waters of the state." In the JCEP application for DEQ permits, how much of those types of contaminants (which could be dioxins, dioxin-like PCBs, or furans) could "be placed in waters of the state" by planned activities doesn't seem to have been sufficiently determined and addressed in the JCEP application.

We were unable to find data for water sampling wells that Weyerhaeuser monitored for water quality around the wastewater treatment lagoon or any independent studies, other

[34] Pacific Connector Gas Pipeline, "Section 404 Permit Application, Attachment E: Contaminated Substances Discovery Plan," October 13, 2017, FERC, Docket CP17-494, p. 1.
[35] Ibid., pp. 7-8.

than the limited general environmental report on the site ("Conservation Prospectus and Environmental Review: Weyerhaeuser Settling Pond Site, Coos Bay, Oregon" by Katalyst, Inc. commissioned by the Cape Arago Audubon Society. Those databases and studies appear to be proprietary to Weyerhaeuser Corp. Overall, there is a notable lack of information available about this significantly contaminated site where mill effluent was pumped, but much more about the Ingram Yard and the mill site itself.

In the past, DEQ has found mineral spirits, hydraulic oil, diesel, heavy-oil-range petroleum hydrocarbons, heavy metals, butylated tin compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and dioxins. The Applicant claims that "The Jordan Cove Meter Station (MP 0.00) is the only location associated with the Pipeline where excavation would have the potential of encountering known contamination." They go on to list nine ESCI or Leaking Underground Storage Tank (LUST) sites, none of which they expect will pose problems. Whether or not they are correct in that warrants further investigation, but what is missing is any mention of seriously contaminated sites that have been under investigation by the EPA and DEQ for decades to the east of the last site JCEP addresses, the Thomason Mining Property near MP 109-10, leaving almost 100 miles (over 40 percent of the total pipeline) without analysis.[36]

There are conceivably several unknown sites of contamination within that segment of proposed pipeline, but there is at least one known site of significance JCEP failed to discuss. A 660-acre site in Klamath Falls formerly owned by Weyerhaeuser and now owned by Collins Company is on DEQ's database (ECSI #655). It is located near MP 198 and bounded on the south side by the Klamath River. The site of concern includes an old landfill, storm water outfall, a sawmill and powerhouse, and sediment. Limited testing has been done and most is over a decade old. But extant test results show that all areas contain multiple contaminants that DEQ summarizes as "petroleum hydrocarbons and constituents; volatile organic compounds; metals." Named contaminants include lead, chromium, manganese, nickel, copper, selenium, zinc, TPD, acetone and methyl-ethyl ketone, methylene chloride, solvents (including trichloroethylene - TCE and perchloroethylene - PCE), 1,1-dichloroethene, TCE, PCE, vinyl chloride, Bis(2-ethylhexyl)phthalate, and arsenic. An excerpt from the ESCI states,

> It should be noted that this segment of the Klamath River is listed as water-quality-limited. In particular, total maximum daily load (TMDL) limits for pH, dissolved oxygen, temperature, ammonia toxicity, and chlorophyll-a are exceeded. The primary reasons for this are thought to be unrelated to point sources, and include algae entering the river from Lake Ewauna and Upper Klamath Lake, agricultural runoff, and historic storage and transfer of logs on the river. The Klamath River National Wildlife Refuge is across the river from the plant.[37]

The ESCI database entry for the site indicates that appropriate cleanup measures have not been executed due to a disagreement over distribution of responsibility between the former and current owner. The alignment maps are not entirely helpful because MP 198.6-198.8 are missing, but the fact that the Applicant presents no information about this only marginally tested, but clearly contaminated ESCI site, is deeply concerning.

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[36] Ibid., pp. 1-6.

[37] Oregon Department of Water, Environmental Cleanup Site Information (ECSI) Database Site Summary Report - Details for Site ID 655, Weyerhaeuser - Klamath Falls.

Release of mercury contamination from mining sites. Additionally, the PCGP will be routed near the Red Cloud, Mother Lode, Nivinson, and Elkhorn mining groups, posing the potential for mercury contamination from historic cinnabar mines. The Applicant's consultant, GeoEngineers, conducted sampling and produced a report on their findings in 2007. At 6.2.2 Ecological Health Risk Screening, the report notes, "Mercury was detected in soil and stream sediment samples at concentrations that exceed ecological risk screening criteria at each of the sampling areas, except in presumed background areas. However, the proposed construction should not alter or adversely affect ecological health at the site or downstream areas because appropriate erosion and sediment control measures at upland and in-stream areas will be rigorously implemented in accordance with the PCGP Erosion Control and Re-vegetation Plan (ECRP) and the site-specific erosion and sediment control plan." GeoEngineers concluded: "It is our opinion that the relatively low concentrations of mercury in sediment in the EFCC channel at the proposed pipeline crossing, along with the limited disturbance area (less than 95 linear feet), does not pose a significant risk to downstream human and ecological receptors." [38] We cannot assess the accuracy of Geoengineers findings or conclusions. However, the extent of disturbance required for this project coupled with factors such as the terrain, the potential for collapsing mining structures, and weather conditions over time suggest that at least more thorough study and consideration of operations and cumulative impacts is needed before any water quality permits are issued for this project. GeoEngineers' work was done over a decade ago and some of the information they relied on is quite a bit older.

Deliberate introduction of chlorine in water used for hydrostatic testing. The Applicant indicates that chlorine will be used in JCEP's hydrostatic testing process, apparently required by Bureau of Land Management (BLM) and U. S. Forest Service (USFS) regulations to control invasive species. We see this as a potential violation of the above narrative criteria. Can it be acceptable to release an undisclosed number up to tens of millions of gallons of water laced with a 2 mg/L of chlorine—a toxin—across acres and acres of Oregon lands? No doubt it will kill the targeted invasive species, but it will also kill a far greater number of native species which are all integral parts of the ecosystem, down to the enormously beneficial worms living in the soil into which this tainted water is intended to seep. It has not appeared to us that there are adequate safeguards in place to ensure that no chemically treated water will make its way to surface waters. To the extent that it does, the fish we are committed to protect could be jeopardized.

Application of extensive quantities of chemical herbicides on the entire pipeline right-of-way. A project of this magnitude provides extensive opportunities for the spread of weeds and other invasive plant species, as well as of harmful insects. The Applicant provides an Integrated Pest Management Plan wherein they inventory various organisms of concern by location and then describe how their activities will not only avoid the introduction or spread of negative influences, but how their presence will provide opportunities to combat existing infestations. How diligently pipeline construction crews will implement the various measures outlined in the Plan cannot be known, e.g., whether they will take the time to wash boots and equipment tires. But we do see strong evidence that chemical herbicides across the extensive available spectrum will be used in massive quantities to maintain the pipeline right-of-way throughout the lifetime of the

[38] "Mine Hazards Evaluation and Mercury Testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn Mining Groups, Jackson and Douglas Counties, Oregon, August 23, 2007." At Appendix R.2 of PCGP FERC application.

LNG operations.

The Plan states that all herbicides will be applied per label instructions, by trained personnel, and under optimal weather conditions, but that is not reassuring. The most carefully controlled circumstances do not negate the fact that enormous quantities of toxic chemicals—from 2 4-D to Tribluralin and all of the hundreds in between with known and unknown unintended negative impacts on humans and other beings—would be entering Oregon's ecosystem, including our water resources, as a direct result of the JCEP.[39]

We stress that this entry of harmful chemicals into our environment and water is unnecessary. We have noted in a very overall sense that this project is not "needed" by the state of Oregon or its residents. Its primary purpose is to benefit Pembina, a foreign corporation, as the pipeline owner and LNG export operator. Its secondary purpose is to benefit the out-of-state and foreign fossil fuel industry by providing an outlet for surplus natural gas and then, to offer market-driven opportunities to produce more fracked gas. The introduction of chemicals into our water and the multi-faceted harm that will bring amounts to the unnecessary contamination of southern Oregon communities.

Described measures for responding to and containing spills are inadequate. The JCEP poses significant risk of jeopardizing the Coos Bay and one to three major rivers with numerous important values by using hydraulic directional drilling (HDD), and that without accurately disclosing the risk or articulating adequate measures to respond in case of a spill or "frac-out."

The details regarding handling of spills during HDD crossings of Coos Bay are too vague and provisional. In Part 2, Appendix 3.0, the Applicant in "Drilling Fluid Release Prevention, Containment and Countermeasures" (p. 4) indicates that,

> a berm may be built around the entire drilling site area. Hay bales or silt screen may be part of the berm on the river side of the drilling area. To contain and control drilling fluid surface releases on the land area, there will be earthmoving equipment such as backhoes or small bulldozers, portable pumps, hand tools, sand, silt fences, and hay bales available at each of the drilling sites. Drilling fluid will be contained and isolated using dirt berms, hay bales, or silt screens. Drilling fluid releases will be cleaned and hauled or pumped to one of the drilling mud storage pits at the closest drilling site.

This description of planned responses is vague and lacks adequate information for anyone to trust that the Applicant has carefully thought through this system. The concept articulated in the section on safety indicates that, since the bay has relatively shallow areas during low tides, a drilling fluid release would likely settle "onto the bay floor, where it may be contained and removed." There is no specificity about how or when this would be done and the plan also disregards conditions such as wind, rain, quantity of mud release, or other events that would affect containment and removal. The Applicant states little more than that they will handle eventualities that may arise.

Self-reporting and self-monitoring do not provide the assurance that DEQ needs that Oregon's Water Quality Standards will not be violated by JCEP.

[39]JPA, Part 2, Appendix E-2, Appendix 2, Tables 2-1 and 2-2.

We are uncomfortable with the “self-reporting” approach taken by the Applicant in its “Contaminated Substances Recovery Plan” and its “Integrated Pest Management Plan.” State agencies are not adequately staffed to conduct monitoring to guard against violations. Responding to degradations with fines and enforcement actions after the fact is not a prudent approach to protect ecosystem services. The critical importance of our water resources and the threats posed by the JCEP are a central reason for our opposition to this project.

Mitigation

The League’s position is to protect air, land, and water resources and prevent water degradation, and thus we are often skeptical of the practice of replacement mitigation. Small projects such as road improvements use culvert improvements nearby the project to offset the need for additional fill. However, a large project such as this is just cause to stop and consider where the benefits and losses are occurring and address alternative approaches and the cumulative effects of the project. If a project like JCEP is allowed via a permit to negatively impact water needed in one place because the Applicant plans to exert a positive impact somewhere else, the disadvantaged area and all who depend on clean, high-quality water in adequate supply still suffer the consequences. We urge DEQ to approach the issue of mitigation and Mitigation Plans with extreme caution.

Environmental Justice

While Oregon does not make specific reference to Environmental Justice in its body of Water Quality Standards, the Environmental Protection Agency and specifically the National Environmental Policy Act (NEPA) requirements call for deliberative and thorough Environmental Justice concerns for all projects of this nature. The Karuk Tribe, Klamath Tribes, Yurok Tribe, Round Valley Tribe, and the Confederated Tribes of Coos, Lower Umpqua, and Suislaw Indians have all expressed deep concerns about cultural resources that would be endangered, destroyed, or otherwise harmed by the JCEP. They have also noted repeated failures of governmental entities and the Applicant to properly and lawfully consult with them regarding the project. We provided information about this in our July 20, 2018 comments to DEQ and the USACE and we urge DEQ to reference those remarks and all communications from and concerns of Tribal groups in overall consideration of JCEP.

IN CONCLUSION

It is essential that DEQ and all other state and federal agencies address our comments and conduct comprehensive and collaborative reviews of the potential impacts of the proposed JCEP to fully assess whether or not the proposed project can comply with the federal Clean Water Act and all other applicable state and federal standards and permitting requirements. **As a result of our review of the JCEP project proposal, we conclude that the project places the four affected counties at high risk of unacceptably degraded water and land resources with few, if any, benefits from the project.**

The LWV believes that governmental bodies must protect the people’s right to know by giving adequate notice of proposed actions, making public records accessible, and providing adequate and appropriate opportunities for the public to provide input on matters that will affect them. We respectfully request that DEQ hold public hearings in at least the four counties that will be impacted directly by the JCEP. We request this input option to ensure that people who find

offering their comments verbally more effective than Internet-based or in writing are able to do so. Hearing sites should be selected so that they are in close proximity to project activities to allow participation by those who would be most heavily impacted. Given that major impacts of the proposed project would have significant relevance to all Oregonians, we request that at least one public hearing be held in each of the northern and eastern parts of the state.

The League of Women Voters is a volunteer organization without any motive other than to work for the best interest of all our citizens. Thank you for accepting and considering our thoughts and concerns and thank you for your service.

Sincerely,

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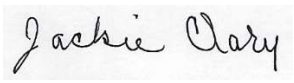

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Oregon Senator Floyd Prozanski
Oregon Senator Arnie Roblan

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Oregon Representative Cedric Hayden
Oregon Representative Gary Leif
Oregon Representative Mike McLane
Oregon Representative E. Werner Reschke
Oregon Representative David Brock Smith
Oregon Representative Caddy McKeown
Coos County Commissioners John Sweet, Bob Main, Melissa Cribbens
Douglas County Commissioners Chris Boice, Tim Freeman
Jackson County Commissioners Rick Dyer, Colleen Roberts, Bob Strosser
Klamath County Commissioners Donnie Boyd, Derrick DeGroot, Kelley Minty Morris
Coos Bay Mayor Joe Benetti
North Bend Mayor Rick Wetherell
Shady Cove Mayor Tom Sanderson
Myrtle Creek Mayor Ken Brouillard
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