APPENDIX R

Comments on the Draft EIS and Responses

(continued)

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Myrtle Point's Drinking Water Source Area** by DEQ in June 2018:

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Dissolved Oxygen
Sampling point for cyanobacteria toxin (2011-2017) Multiple rivers and streams are already listed as Water Quality Limited (See Water Quality Analysis 10.31.2014)

Winston Dillard Water District (PWS 4100957)
Source: South Umpqua River
Douglas County
Serves 8,000 people

DEQ Source Water Assessment 2003 (excerpts):

There are eleven other public water systems located upstream of the Winston-Dillard intake that obtain their drinking water from the South Umpqua River or its tributaries. This source water assessment addresses the geographic area providing water to Winston-Dillard's intake (Winston Dillard's portion of the drinking water protection area) between Winston-Dillard's intake and the next upstream intake for Roseburg Forest Products.

Risks for the system, according to the Water Summary Brochure: A total of 36 potential contaminant sources were identified in Winston-Dillard's drinking water protection area. Of these, 34 are located in the sensitive areas and 29 are high-to- moderate risk sources within "sensitive areas". *The sensitive areas within the Winston- Dillard drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.*

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Winston- Dillard's Drinking Water Source Area by** DEQ in June 2018:

Previous HAB Advisory

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Algae and aquatic weeds, Chlorophyll-A, pH, Dissolved Oxygen

OHA DWS sampling location for cyanobacteria toxin (2011-2017)

Roseburg Forest Products-Dillard (PWS 4194300)
Source: South Umpqua River
Douglas County

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Serves 2,000 people

From 2003 Source Water Assessment Summary Brochure (excerpts):

RISKS FOR THE SYSTEM:

A total of 18 potential contaminant sources were identified in Roseburg Forest Products' drinking water protection area. Of these, 17 are located in the sensitive areas and 14 are high-to-moderate risk sources within "sensitive areas". *The sensitive areas within the Roseburg Forest Products drinking water protection area include, but are not limited to, areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.*

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Roseburg Forest Products - Dillard Drinking Water Source Area** by DEQ in June 2018:

Previous HAB Advisory

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Algae and aquatic weeds, Chlorophyll-A, pH, Dissolved Oxygen

Clarks Branch Water Association (PWS 4100548)
Source: South Umpqua River
Douglas County
Serves 140 people

DEQ Water Source Assessment Summary Brochure 2003 (excerpts):

RISKS FOR THE SYSTEM:

A total of 36 potential contaminant sources were identified in Clarks Branch's drinking water protection area. Of these, 35 are located in the sensitive areas and 32 are high-to- moderate risk sources within "sensitive areas." (Maps are available from the 2003 Source Water Assessment.) *The sensitive areas within the Clarks Branch drinking water protection area include, but are not limited to, areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential*

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contamination sources, if present, have a greater potential to impact the water supply.

Potential Harmful Algae Bloom (HAB) risk criteria/factors identified in Clarks Branch Drinking Water Source Area by DEQ in June 2018:

Previous HAB Advisory

Water Quality Limited Listing indicating the waterbody needs TMDL for

Algae and aquatic weeds, Chlorophyll-A, pH, dissolved oxygen

Waters of potential concern for HAB

Tri-City JW and SA (PWS 4100549)
Source: South Umpqua River Douglas County
Serves 3,500
Number of connections: 1,500

DEQ Source Water Assessment 2003 (excerpts):

RISKS FOR SYSTEM:

A total of 40 potential contaminant sources were identified in Tri-City Water District's drinking water protection area. Of these, 37 are located in the sensitive areas and 32 are high- to moderate- risk sources within "sensitive areas". *The sensitive areas within the Tri-City Water District drinking water protection area include, but are not limited to, areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.*

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Tri-City JW and SA Drinking Water Source Area** by DEQ in June 2018:

Previous HAB Advisory

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Algae and aquatic weeds, Chlorophyll-A, pH, dissolved oxygen

OHA DWS sampling location for cyanobacteria toxin (2011-2017)

Hiland Water Co. Shady Cove (PWS 4101520)
Source: Rogue River
Serves 975 people

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Due to the close proximity of intakes on the Rogue River, the following April 24, 2018 assessment of Anglers Cove/SCHWC addresses Hiland Water Co. Shady Cove.

Anglers Cove/SCHWC (PWS 01483)
Source: Rogue River
Jackson County
Serves 80 people

DEQ/OHA Source Water Assessment April 24, 2018 (excerpts):

Due to the close proximity of intakes on the Rogue River, this assessment addresses Anglers Cove/SCHWC and Hiland Water Co. Shady Cove.

Country View Mobile Home Estates also has an intake on the Rogue River upstream of these intakes and there are a number of public water systems downstream that also depend on Rogue River for their drinking water. For watersheds with more than one intake such as the Rogue Subbasin, all protection areas for intakes upstream of the water system's intake are included in their drinking water source area. Activities and impacts in upstream drinking water protection area also have the potential to impact downstream water users.

A. Potential Pollutants: 8 hour Time of Travel for Drinking Water Source Sub-Basin of Rogue

- Drinking Water Source Area: *219 sq. mi*
- Stream Miles in Drinking Water Source Area: *1,288*
- Stream Miles in Erodible Soils: *1,227*
- High Soil Erosion Potential Percent: *96%* (% stream mi with high erosion located w/in 300' of stream)
- Shallow Landslide Potential: *See DEQ*
- Landslide Deposits: *Limited areas throughout watershed* includes earth and debris slides, flows, slumps, falls and complex landslide types. (Does not include rock material landslide deposits.)

B. Full Source Water Source Area Rogue Basin upstream of intake

- Drinking Water Source Area: *6,229 sq. mi*
- Stream Miles in Drinking Water Source Area: *4,717*
- Stream Miles in Erodible Soils: *3,558*
- High Soil Erosion Potential Percent: 75% (% stream mi with high erosion located w/in 300' of stream):
- Shallow Landslide Potential: *See DEQ*
- Landslide Deposits: *Limited areas throughout watershed* includes earth and debris slides, flows, slumps, falls and complex landslide types. (Does not include rock

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material landslide deposits.)

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Hiland Water Co. Shady Cove and Anglers Cove/SCHWC Drinking Water Source Area** by DEQ in June 2018:

Previous HAB Advisory

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Algae and aquatic weeds, pH

Country View Mobile Home Estates (PWS #4100808)

Source: Rogue River plus a well
Jackson County
Serves 132 people
Oregon Source Water Assessment Report (excerpts):

In the Country View Mobile Home Estates watershed, the results of the susceptibility "analysis" include the distribution of 22 identified *high-to-moderate risk sources within the areas of highly permeable soils, high erosional soils, high runoff potential soils, and within the 1000' setback from the streams.*

A. Potential Pollutants: 8 hr time of travel in Drinking Water Source Area

- Stream miles in Drinking Water Source Area: 1,334
- Watershed Source Area: 227.86 sq mi
- High Soil Erosion Potential: *95%*
- Shallow Landslide Potential: *See DEQ*
- Landslide Deposits: *Limited areas throughout watershed* includes earth and debris slides, flows, slumps, falls and complex landslide types. (Does not include rock material landslide deposits).

B. Potential Pollutants: Full Surface Drinking Water Source Area

- Watershed Source Area: *1,146.6 sq mi*
- Stream miles in Drinking Water Source Area: *4,613*
- Stream miles in erodible soils: *3,156*
- High Soil Erosion Potential: *68%*
- Shallow Landslide Potential: *See DEQ*
- Landslide Deposits: *Limited areas throughout watershed* includes earth and debris slides, slumps, falls, and complex landslide types. (Does not include rock material landslide deposits).
- Well Protection Area: *0.51 sq mi*

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Excellent maps are available in DEQ's Updated Water Source Assessment (April 2018).

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Country View MH Estates Drinking Water Source Area** by DEQ in June 2018:

Previous HAB Advisory

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Algae and aquatic weeds, pH, dissolved oxygen

OHA DWS sampling location for cyanobacteria toxin (2011-2017)

Tiller Elementary, SD #15 (PWS 4192139)
Source: South Umpqua River
Serves: 60 people

DEQ Source Water Assessment Summary 2003 (excerpts):

RISKS FOR THE SYSTEM:

A total of eighteen potential contaminant sources were identified in Tiller Elementary's drinking water protection area. Sixteen of these are located in the sensitive areas and twelve are high-to-moderate risk sources within "sensitive areas". *The sensitive areas within the Tiller Elementary drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.*

City of Glendale (PWS 4100323)
Source: South Umpqua Subbasin: Cow Creek (permanent), Mill Creek (emergency), Section Creek (emergency)
Douglas County
Serves 872 people

2003 Source Water Assessment (excerpts):

The drinking water for the City of Glendale is supplied by three intakes located on Cow Creek, Mill Creek and Section Creek.

RISKS FOR THE SYSTEM:

A total of 45 potential contaminant sources were identified in City of Glendale's drinking water protection area. All of these are located in the sensitive areas and 40 are high-to- moderate risk sources within "sensitive areas". *The sensitive areas within the City of Glendale drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff*

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potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.

C. Additional Threats to Drinking Water

Applications of herbicides, including picloram, to clear and maintain a right-of-way free of vegetation on and near the pipeline route increase risks to safe drinking water. Picloram, in particular, is quite persistent in the environment. According to the EPA:[224]

- Picloram has a high potential to contaminate surface water by runoff from use areas.
- Picloram is highly soluble in water, resistant to biotic and abiotic degradation processes, and mobile under both laboratory and field conditions. It is stable to hydrolysis and anaerobic degradation, and degrades very slowly with half-lives ranging from 167 to 513 days.
- Eventual contamination of groundwater is virtually certain in areas where picloram residues persist in the overlying soil. Once in groundwater, picloram is unlikely to degrade, even over a period of several years.

Potential Harmful Algae Bloom (HAB) **risk criteria/factors identified in Glendale's Drinking Water Source Area** by DEQ in June 2018:

DEQ Water Quality Limited Listing indicating the waterbody needs TMDL for Dissolved Oxygen

D. Coos Bay Watershed Impacts.

Coos Bay is the extensive estuary of the Coos and Millicoma Rivers. Occupying approximately 20 square miles, the bay is the second largest drowned river valley estuary on the Oregon Coast. Tidelands cover approximately 4,569 acres including 2,738 acres of tidal marsh and 1,400 acres of eelgrass beds. The estuarine system's primary features include the main, expansive bay, an extensive arch of water around a peninsula, and major arms—South Slough, near the entrance of the bay, Jordan Cove, at the heart of the bay, and Haynes Inlet, which extends northeasterly from the main body of the bay. Jordan Cove, site of the proposed LNG export facility of the same name, is an embayment on the eastern shore of the North Spit, which encloses the outer portion of Coos Bay estuary.

The natural environment of the Coos estuary supports a diversity of plants and animals. The extensive shallow tidal flats provide habitat for shellfish as well as feeding and spawning habitat for many native fish. The Coos Bay supports a variety of beneficial uses as designated in the

[224] (U.S. Environmental Protection Agency, 1995) https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-005101_1-Aug-95.pdf

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South Coast Basin as a whole.[225] These include fish and aquatic life, wildlife & hunting, fishing, boating, water contact recreation, aesthetic quality, and commercial navigation & transportation.

Coos Bay is central to Oregon's commercial fishing industry, whose economic contribution is equivalent to about 10,000 jobs. Economic contributions from commercial fishing go beyond harvesting and seafood-processing, and include visitors and tourism, boat building and gear manufacturing, safety, research and education.[226] Recreational fisheries, including shellfish harvest and crabbing, are also important resources in Coos Bay. Several of the most important shellfish beds are located in close proximity to the LNG transit route along the edge of the North Spit (western side of lower Coos Bay).

Both Coos Bay and the Coos River are water quality impaired for different pollutants, including but not limited to temperature, sedimentation, and toxics such as lead.

Table 1. 303(d) Listings for Streams Crossed by Pacific Connector Pipeline in the South Coast Basin – Coos Subbasin[227]

Waterbody Crossed by Pipeline	Dissolved Oxygen	Habitat Modification	Temperature	Biological Criteria	Sedimentation	Toxics
Coos Bay					X	X
Coos River			X		X	

Coos Bay and the Coos River support salmonid species, including Oregon Coast coho (*Oncorhynchus kisutch*), winter steelhead (*Oncorhynchus mykiss irideus*), fall Chinook salmon (*Oncorhynchus tshawytscha*), and coastal cutthroat trout (*Oncorhynchus clarki clarki*).[228] Coos Bay and the Coos River support ESA-listed species, including but not limited to Oregon Coast coho and green sturgeon.

1. Stream Crossings

All of the stream crossings proposed for the Coos Subbasin would use a dry open-cut method, except for the two HDD crossings proposed for Coos Bay and the HDD crossing proposed for the Coos River. The DEIS should comprehensively review each stream crossing, particularly for those crossings identified as moderate or high risk. Further, the DEIS should require a topographic survey, longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes for each stream crossing. CO28-148

[225] *See* Table 300A (OAR 340-041-0300).
[226] *See* Oregon Commercial Fishing Industry Year 2016 Economic Activity Summary at 5 (April 2017).
[227] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.
[228] Salmonids in the Lower Coos Watershed. Partnership for Coastal Watersheds. http://www.partnershipforcoastalwatersheds.org/salmonids-in-the-lower-coos-watershed/.

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CO28-148 The EIS provided an assessment of potential impacts to aquatic resources from stream crossing in section 4.5.2.3. The Applicant applied the FWS Stream Crossing Risk Analysis matrix assessment to fluvial stream crossings and developed varied BMPs to address the potential issues of concern at crossings depending on risk level. Additionally, they would conduct pre-construction surveys of sites that did not have access to confirm level of risk and adjust crossing methods as needed. They have developed specific crossing plans for stream crossing on Forest Service and BLM administered lands as mandated by these federal agencies. During construction, an EI would be on site to ensure that actions designated in plans are implemented. There is no federal requirement to develop site-specific crossing plans on private lands. The State during their permitting process can make additional requirements as they determine are needed to meet the permit standards (see also comment SA2-205).

In addition to the potential for increased erosion, channel migration, avulsion, and/or scour as a result of pipeline crossings, many of the proposed crossings cut through waterbodies that are already impaired for sedimentation. Channel modifications that increase sedimentation can decrease the depth and frequency of pools, which decreases the assimilative capacity for thermal loading of a stream.[229] Proposed activities to conduct dry open cut technology have the potential to increase sedimentation, modify habitat, decrease dissolved oxygen, and impair the aquatic habitat.

2. Coos Bay HDD Crossings

The applicant proposes to install the 36-inch pipeline across Coos Bay using two horizontal directional drills (HDD) of 5,200 and 9,000 feet each. This is a significant change from the prior route, which crossed Haynes Inlet at the north of Coos Bay and away from the navigation channel constructed using an open wet cut method after rejecting the use of HDD. In 2006, the applicant's engineer described challenges for the crossing:

The length, diameter, and geometry of the crossing approach the limits of successfully completed HDD crossings…In our opinion, the geometric and mechanical requirements for this crossing reduce the potential for successfully completing the crossing. [230]

The applicant's engineer concluded, "[a] crossing of this magnitude would not be considered routine and the potential for failure would be substantial."[231] The HDD crossing of Haynes Inlet was determined "non-feasible" due to cumulative effects of the geotechnical conditions, construction capabilities, and workspace constraints.[232]

HDD crossings, even when successful, have impacts in areas adjacent to waters where staging and construction areas occur. HDDs also require the disposal of materials extracted from the drill hole. HDD attempts frequently fail, causing drastic impacts to water quality and fish habitat. The DEIS fails to disclose and analyze the likelihood and frequency of frac-out events. Instead, the DEIS at 4-269 merely acknowledges the possibility, stating:

The current pipeline route in the bay would be two HDD spans of 0.7 and 1.6 miles with no planned subtidal or intertidal habitat disturbance. Generally, an HDD would avoid direct effects on the bay and associated estuarine resources. However, an HDD requires the use of drilling mud as a lubricant during the process. This fluid is under pressure and there is a possibility of an inadvertent release of drilling mud through a substrata fracture, allowing it to rise to the surface (also referred to as a frac-out).[233]

CO28-149

Additionally, DEQ in its denial of the 401 certification for the project identifies the lack of comprehensive feasibility analysis for the Coos Bay HDD. Specifically, DEQ states:

However, JCEP's consultant states that the "* * *feasibility evaluation of the proposed Coos Bay East HDD is based on limited subsurface data. Our conclusions should be considered preliminary

[229] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-20.
[230] Geoengineers Memorandum to Lori Dalton, Williams Northwest Pipeline (Nov. 15, 2006).
[231] Geoengineers Memorandum to Lori Dalton, Williams Northwest Pipeline (Nov. 15, 2006).
[232] PCGP ltr (June 1, 2010).
[233] 2019 DEIS at 4-269.

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CO28-149 Hydraulic fracture and IR potential were evaluated for the crossings in the HDD feasibility assessment. Elevated risks of drilling fluid surface release occurring near the entry and exit points during HDD are common due in part to the reduced overburden pressure at these locations. During drilling, the contractor would monitor annular drilling fluid pressures to help identify when the potential for a surface release of drilling fluid may be possible. Annular pressures can be monitored through the use of an annular pressure tool as part of the bottom hole assembly (BHA) during pilot hole drilling.

pending completion of a subsurface exploration program. Resource Report 2, Appendix G.2. The feasibility analysis generally finds a low risk of drilling fluid releases. However, at the east end of the crossing approaching Kentuck Slough there is a high risk of hydraulic facture and drilling fluid surface release. Resource Report 2, Appendix G.2., at 9. The evaluation identifies potential mitigation for this risk, but it is unclear what specific mitigation measures JCEP is currently proposing.[234]

CO28-149 cont.

As part of the agency's rationale for denying the 401 certification for the project, DEQ specifically states that the lack of available information regarding the proposed Coos Bay HDD crossings did not provide reasonable assurance that those HDD crossings would comply with state water quality standards under OAR 340-041-007.[235] The DEIS should adequately characterize and review the proposed activities and mitigation measures for the proposed Coos Bay HDD crossings.

The DEIS should also comprehensively evaluate the geologic hazards associated with the proposed Coos Bay HDD crossings. In its 2017 scoping comments, DOGAMI noted that "geologic hazard evaluations and proper mitigation of hazards are needed."[236] The State requested "a thorough geologic characterization of the project area and surrounding area and a comprehensive site-specific geologic hazard and geotechnical assessment . . . at the proposed facility and along the pipeline with supporting evidence to explain that the facility can be appropriately constructed and operated throughout its existence."[237]

3. The 2019 DEIS does not take into consideration the Applicant's most current HDD Feasibility Evaluation for the Coos Bay Estuary.

During the pendency of the EIS process for the proposed Pipeline, the Applicant has been seeking multiple local and state permits required to authorize its proposed use of Horizontal Directional Drilling ("HDD") and Direct Pipe technology to site and locate its proposed Pipeline within Coos Bay. Subsequent to the publication of the 2019 DEIS, the Applicant submitted a "Revised HDD Feasibility Evaluation" to Coos County in conjunction with its permit request for the proposed segment of the Pipeline under Coos County's jurisdiction.[238] A copy of this Revised HDD Feasibility Evaluation is attached to this comment.[239] A full analysis addressing the inconsistencies between Appendix D.2 in Resource Report 2 (part of PCGP's application to the FERC) and the Applicant's 2019 Revised HDD Feasibility Evaluation for Coos County should be provided for public comment in a supplemental DEIS prior to any substantive decision to approve the requested Certificate. These inconsistencies are discussed in further detail below.

CO28-150

[234] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 29.
[235] Evaluation and Findings Report: Section 401 Water Quality. P. 30.
[236] State of Oregon 2017 Scoping comments at 8.
[237] Id.
[238] *See* Pacific Connector Gas Pipeline ("PCGP"), *Applicant's First Open Record Period Submittal*, Coos Cnty. File No(s) AM-18-010/HBCU-18-002. Ex. 11 (Dated Apr. 12, 2019) [hereinafter *Revised HDD Feasibility Evaluation*] http://www.co.coos.or.us/Portals/0/Planning/AM-18-010-HBCU-18-002/PCGP%20Early%20Works%20First%20Open%20Record%20Period%20Submittal.PDF.
[239] *See Attach.* 1.

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CO28-150 We have not received the "Revised HDD Feasibility Evaluation" mentioned in this comment, and cannot comment or address the theoretical Applicant prepared document that was not filed with the Commission.

4. The 2019 DEIS fails to adequately describe the scope of the proposed HDD crossing for Coos Bay East and Coos Bay West.

The Applicant's Revised HDD Feasibility Evaluation provides more comprehensive details regarding the conceptual design of the proposed Coos Bay East and Coos Bay West pipeline crossings than those contained in the DEIS.[240] Per the 2019 DEIS, PCGP proposed to use the HDD method to cross under the Coos Bay Estuary (MPs 0.3–1.0 and 1.5–3.0).[241] It also included a feasibility analysis, attached as Appendix G.2 of Resource Report 2 as part of Pacific Connector's 2017 application to the FERC.[242] The data contained within the 2019 DEIS' regarding the feasibility of the proposed use of HDD technology to cross Coos Bay is limited to the following:

That study showed that the HDD under the Coos Bay Estuary could be completed in two sections with a total length of about 8,970 feet and a maximum depth of about -190 feet…In case of an HDD failure, or the unanticipated release of drilling mud, Pacific Connector prepared a contingency plan.[243]

CO28-151

This description provided in the 2019 DEIS of the total length of the two sections (8,970 ft) differs from the combined length provided the 2019 Revised HDD Feasibility Evaluation (14,109 ft). Per the 2019 Revised HDD Feasibility Evaluation, the design horizontal length of the Coos Bay West crossing is approximately 5,137 feet.[244] Per the 2019 Revised HDD Feasibility Evaluation, the Coos Bay East crossing design horizontal length of the conceptual HDD is 8,972 feet.[245] The 2019 DEIS fails to adequately address pipe string laydown along Kentuck Slough Valley for the Coos Bay East crossing. In contrast, the Applicant states in its Revised HDD Feasibility evaluation that the bottom tangent was designed with a 25.62-degree horizontal curve, in order to accomplish the necessary alignment to facilitate the pipe string laydown area along Kentuck Slough Valley at the east end of the crossing.[246] These discrepancies regarding the scope of proposed HDD crossing of Coos Bay East and Coos Bay West should be addressed in a supplemental DEIS prior to the publication of a final EIS in this matter.

5. Both the 2019 DEIS and the Revised HDD Feasibility Analysis fail to establish that the Applicant's proposed use of HDD technology to place the Pipeline under the Coos Bay Estuary would be feasible.

As discussed below in this comment, the 2019 DEIS fails to fully evaluate the feasibility of the applicant's proposed use of HDD technology to cross Coos Bay. The Revised HDD Feasibility Evaluation suffers from a similar deficiency, which further undermines the

[240] *See Revised HDD Feasibility Evaluation*, 1, 68.
[241] 2019 DEIS, 2-62.
[242] 2019 DEIS, 2-62.
[243] 2019 DEIS, 2-62 - 2-63 (citing Appendix H.2 to Resource Report 2 as part of Pacific Connector's 2017 application to the FERC).
[244] *Revised HDD Feasibility Evaluation*, 6.
[245] *Revised HDD Feasibility Evaluation*, 73.
[246] *Revised HDD Feasibility Evaluation*, 73.

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CO28-151 See response to comment CO28-150.

Applicant's assertion that "the HDD under the Coos Bay Estuary could be completed in two sections with a total length of about 8,970 feet…"[247] Specifically:

a. The Revised HDD Feasibility Evaluation only suggests "technical" feasibility, and includes a number of limitations and guidelines for use that raise doubts about the practical feasibility of both the Coos Bay East and the Coos Bay West crossings.

The revised Coos Bay West and Coos Bay East HDD feasibility evaluations conclude that the use of HDD technology for the crossing is "technically" feasible.[248] However, both conclusions are solely based on physical characteristics. Neither of the Revised HDD Feasibility Evaluations comment on whether the crossings are practically or logistically feasible, and both are subject to many limitations, including recommendations for further study to determine feasibility. For instance, geotechnical engineering recommendations for both Revised HDD Feasibility Evaluations are preliminary.[249] Limitations provided for the Revised HDD Feasibility Evaluations also state that sampling cannot provide a complete and accurate view of subsurface conditions for the entire site.[250] Although the Revised HDD Feasibility Evaluations appear to address geotechnical feasibility to some extent, they do not address environmental impacts or anthropogenic impacts. A more comprehensive analysis is needed with evaluation of potential adverse impacts arising from HDD technology based on constructability, as well as potential impacts that will arise in the process of successfully completing the HDD crossings within acceptable risk tolerances. A supplemental DEIS addressing the lack of data regarding practicable feasibility of the proposed Coos Bay East and Coos Bay West crossings must be issued with adequate consideration for potential adverse environmental impacts.

CO28-152

b. It is unclear which HDD method will be used to accomplish the Coos Bay East crossing.

The 2019 DEIS fails to discuss which HDD method will be used to accomplish the Coos Bay East crossing. Pacific Connector has previously described two conceptual options (i.e., Single Horizontal Directional Drilling Option and a Dual Horizontal Directional Drilling Option) to accomplish the Coos Bay East HDD crossing.[251] In the Revised HDD Feasibility Evaluation, the Applicant simply states: "Due to the substantial length of the HDD, we anticipate that it will be completed using pilot hole intersect methods."[252] However, there is no discussion as to why the "pilot hole intersect" method is now preferable to a previously proposed "tie-in method."[253] The Applicant should provide discussion as to how this method differs from the previously mentioned Single and Dual Options.

CO28-153

[247] *See* 2019 DEIS, 2-62.
[248] *See Revised HDD Feasibility Evaluation*, 6; *See Revised HDD Feasibility Evaluation*, 73.
[249] *See Revised HDD Feasibility Evaluation*, App. D, 64; *See Revised HDD Feasibility Evaluation*, App. D, 159.
[250] *See Revised HDD Feasibility Evaluation*, App. D, 64; *See Revised HDD Feasibility Evaluation*, App. D, 159.
[251] *DEQ Additional Information Request Letter*, 3 (March 11, 2019) https://www.oregon.gov/deq/Programs/Documents/jcepAddInfoRequest03112019.pdf.
[252] *See Revised HDD Feasibility Evaluation*, 73.
[253] *See Revised HDD Feasibility Evaluation*, 84.

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CO28-152 A condition that a final feasibility study be provided for review prior to construction has been added to the final EIS.

CO28-153 See response to similar comments from the Western Environmental Law Center.

If the Applicant is proposing to use the Single HDD Option, it must address what alternative measures might be used should PCGP discover that the underlying geology does not consist of competent bedrock at the bottom tangent elevation depth (-190 feet mean sea level).[254] Further, hydraulic fracture of bedrock increases the potential for fluid release. More data regarding site specific risks must be provided.

If the Applicant is proposing to use the Dual HDD Option, the Applicant has failed to provide sufficient discussion on the following issues:

- The dual option relies on a shared tie-in workspace located in a tidal flat area south of Glasgow Point. Describe how the workspace will be isolated from open water during Horizontal Directional Drilling installation.
- The likelihood of inadvertent surface returns of drilling fluid is highest near entry points where drilling pressures can exceed the shear strength and pressure from overburden soils. Describe what special contingency measures will be employed to contain drilling fluids in this inter-tidal environment.
- What is the proposed final depth below surface of the installation at the tie-in location? What measures, if any, are proposed to ensure the pipeline remains buried for the life of the project?
- Describe the scope of open-water activities such as intetidal dredging for barge access to the shared tie-in workspace.
- Describe what procedures Pacific Connector will employ to avoid, minimize, or mitigate the effects of this option on water quality.[255]

The Applicant must provide a clear description of proposed HDD construction methods, an explicit statement of which method it has selected for use, and a full analysis of potential adverse impacts prior to any substantive decision on the Certificate. A supplemental DEIS should be issued to fully address the aforementioned deficiencies.

CO28-153 cont.

c. Parcel ownership of the potential shared tie-in workspace located in a tidal flat area south of Glasgow Point associated with the proposed Dual HDD option is unclear.

As discussed above, neither the Revised HDD Feasibility Evaluation nor the 2019 DEIS addresses which method will be used to accomplish the Coos Bay East crossing. A 2017 analysis by GeoEngineers stated: "Due to the substantial length of the proposed HDD, GeoEngineers evaluated two potential alternatives for accomplishing the proposed Coos Bay East 36-inch HDD installation; a single 8,972-foot-long alternative and two shorter HDDs connected by an *open cut tie-in located within the tidal flats of Coos Bay*." Neither the 2019

CO28-154

[254] *DEQ Additional Information Request Letter*, 3.
[255] *DEQ Additional Information Request Letter*, 3-4.

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CO28-154 The Applicant has not proposed either of the methods outlined in this comment section 2. Our EIS assesses the Project as proposed, and considers reasonable alternatives.

DEIS nor the Revised HDD Feasibility Evaluation contain the relevant parcel ownership information for this proposed shared tie-in workspace in the middle of the Bay just south of Glasgow Point. If the Applicant is proposing to use the Dual Drilling Option, or should the pilot intersect method require the shared tie-in work area, it must provide ownership details for the subject parcel. Further, it must provide further detail addressing potential adverse environmental impacts of the proposed tie-in area. A map of the previously proposed propo

CO28-154 cont.

d. The length of the proposed Coos Bay East crossing is outside the recommended parameters for Direct Pipe technology installation.

The Revised HDD Feasibility Evaluation concludes that the Coos Bay East crossing is technically feasible on the basis of three new bore holes for a crossing of almost 9,000 feet.[256] This crossing requires the use of specialized "Direct Pipe" installation technology. The Applicant discloses that the use of Direct Pipe technology itself would require an additional feasibility study prior to developing more specific design and installation recommendations. Site-specific studies regarding the feasibility of the use of Direct Pipe technology in Coos Bay are provided in neither the 2019 DEIS nor the Revised HDD Feasibility Evaluation.

CO28-155

The longest recommended distance of pipeline installation using Direct Pipe is 1,000 yards (about 3,000 feet). Both the Coos Bay East and West crossing are substantially greater in length than the recommended range. Publicly available evidence also suggests that the machinery associated with Direct Pipe installation requires anchoring and should not be installed in soft soils to avoid sinking under its own weight. The proposed location for this equipment appears to be Kentuck Slough, which has soft soils. Without more information on the feasibility of the use of HDD technology to cross Coos Estuary generally and a feasibility study on the use of Direct Pipe specifically, the FERC should not move forward with a substantive decision. A supplemental DEIS addressing the aforementioned issues should be provided to the public for comment prior to the publication of the final EIS in this matter.

e. Neither the 2019 DEIS nor the Revised HDD Feasibility Evaluation contains a discussion of the alternatives to be used should the use of HDD technology prove infeasible.

If the Coos Bay East and the Coos Bay West crossings cannot be accomplished by the use of HDD technology, the open trench cutting method across the bay will likely have to be utilized. The 2019 DEIS discusses the use of trenching for Pipeline installation in upland areas without any relevant discussion on potential adverse impacts. The use of open trench cutting has potentially serious environmental and public health impacts, and have not been adequately addressed. A supplemental DEIS addressing these impacts should be issued.

CO28-156

[256] *See Revised HDD Feasibility Evaluation*, Fig. 2, 91.

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CO28-155 We have not received the "Revised HDD Feasibility Evaluation" mentioned in this comment, and cannot comment or address the theoretical Applicant prepared document that was not filed with the Commission.

CO28-156 As indicated in the EIS, an open cut method is not proposed and would not be authorized under this NEPA process. As a result, an impact assessment of the open cut method is not required or appropriate.

f. Within the Revised HDD Feasibility Study, a borehole used in the study of the Coos Bay West crossing is not located on or in close proximity to the conceptual line.

The Revised HDD Feasibility Evaluation concludes on the basis of four boreholes that the Coos Bay West crossing, with a span nearly 6,000 feet, is technically feasible.[257] The conceptual site plan, however, shows the location of a borehole (HIB-2) not situated on the conceptual line.[258] The HIB-2 borehole is noted as 265 feet off the alignment.[259] The 2019 DEIS suffers from similar deficiencies in testing for feasibility. PGCP must test the soils in the actual proposed installation location prior to any substantive decision in this matter. The results of those studies should be made available for public comment prior to the publication of the final EIS. CO28-157

g. Concerns related to drill hole stability regarding the Coos Bay East Crossing.

The Revised HDD Feasibility Evaluation states that "the subsurface conditions anticipated along the conceptual HDD path include very soft silts and loose sands along the east side entry tangent."[260] It warns that "the HDD contractor may encounter hydraulic fracture, steering difficulty, and difficulty maintaining drilling fluid returns along the east side entry tangent."[261] The 2019 DEIS does not adequately discuss the proposed use of contractors to accomplish the HDD crossings. Logistical challenges such as hydraulic fracture should not be left to the discretion of the HDD contractor, but instead be addressed by PCGP prior to any final decision in this matter. A supplemental DEIS addressing this concern should be provided for public comment. CO28-158

h. The 2019 DEIS does not contain a meaningful plan for drilling fluid management, and does not sufficiently address the risks of inadvertent drilling fluid release and frac-out for both the Coos Bay East and the Coos Bay West crossings.

Neither the 2019 DEIS nor the Revised HDD Feasibility Evaluation meaningfully address the risk of inadvertent fluid returns to surface waters of the bay during the proposed HDD crossings. Specific issues include:

i. Analyses of fluid release are based on assumptions and estimates.

The analysis of fluid release contained within the Revised HDD Feasibility Evaluation notes that it is based on assumptions and estimates.[262] The contingency plan referenced within the 2019 DEIS suffers from a similar reliance on assumptions and estimates.[263] This is insufficient given CO28-159

[257] *See Revised HDD Feasibility Evaluation*, Fig. 2A, 91.
[258] *See Revised HDD Feasibility Evaluation*, Fig. 2A, 91.
[259] *See Revised HDD Feasibility Evaluation*, Fig. 2A, 91.
[260] *See Revised HDD Feasibility Evaluation*, 81.
[261] *Id.*
[262] *See Revised HDD Feasibility Evaluation*, 51; *See Revised HDD Feasibility Evaluation*, 146.
[263] 2019 DEIS, 2-62 - 2-63 (citing Appendix H.2 to Resource Report 2 as part of Pacific Connector's 2017 application to the FERC).

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CO28-157 We have not received the "Revised HDD Feasibility Evaluation" mentioned in this comment, and cannot comment or address the theoretical Applicant prepared document that was not filed with the Commission.

CO28-158 Hydraulic fracture and IRs are a potential occurrence for HDDs. Geoengineers did conduct quantitative hydrofracture analysis, where they were appropriate and qualitative analysis where the drill would pass through bedrock using rock core RQD information. They also prepared an HDD Drilling Mud Contingency Plan for an IR that would be followed during drilling.

CO28-159 The risk of hydraulic fracture is greatest during the drilling of a pilot hole. During pilot hole drilling, the contractor would employ the use of an annular pressure monitoring too as part of their BHA that would monitor annular pressures alerting the operator to spikes in pressure and a possible hydraulic fracture that would allow the HDD contractor to take steps to bring pressure down and reduce the risk of an inadvertent drilling fluid return. In order to minimize the risk of drilling fluid impact during the reaming process, the HDD contractor would maximize drilling fluid circulation by using appropriate means and methods, so that cuttings are efficiently removed from the hole and so that annular pressures are minimized. In the event that circulation is lost or significantly diminished, steps would be taken by the HDD contractor to restore circulation. If circulation is unattainable, the HDD contractor, using the appropriate means and methods would adjust fluid rheology, flow rate, and penetration rates to reduce annular pressure so that the risk of inadvertent drilling fluid returns are reduced.

the known risks of frac-out. The Applicant should conduct further testing and present a more robust analysis of impacts alongside a more concrete fluid management plan. Further, the Revised HDD Feasibility Evaluation also discloses that it only addresses the potential for inadvertent fluid release during pilot hole operations. The Applicant must also address the potential risk of fluid release during the reaming process prior to a final decision in this matter. A supplement DEIS adequately addressing these potential adverse impacts should be provided for public comment.

CO28-159 cont.

j. Concerns regarding fluids management system for the Coos Bay East crossing.

The Applicant discloses that "there is a high risk of drilling fluid release within approximately 520 feet of the east side entry point" of the Coos Bay East crossing.[264] The Revised HDD Feasibility Evaluation discusses the importance of maintaining fluid returns during reaming, and states "a drilling fluid recycling system and high-pressure drilling fluid pump will likely be required on the exit side of the crossing to facilitate the pumping and recycling of the drilling fluid at exit."[265] Information regarding the exact locations of these systems and a substantive analysis of their impacts is omitted from both the Evaluation and the 2019 DEIS. Most concerningly, the Evaluation refers to an "east side drilling fluid returns pit."[266] Apart from the FERC wetland requirements document, no substantial discussion of this pit is provided. The digging, dewatering, and management of this pit could have serious potential impacts on the estuary and should be disclosed and explained in a supplemental DEIS.

CO28-160

k. Concerns regarding drilling fluid surface releases or "frac-outs".

The Revised HDD Feasibility Evaluation states that "If the accumulation of cuttings creates a blockage downhole, the annulus may become over-pressurized, leading to hydraulic fracturing and potentially drilling fluid surface releases."[267] The analysis "does not account for this over-pressurized condition."[268] The 2019 DEIS does not address this issue. A supplement DEIS addressing this concern must be issued for public comment prior to publication of the final EIS.

CO28-161

E. Coos River HDD Crossing

In addition to the two HDD crossings proposed for Coos Bay, the applicants propose to use HDD technology to cross the Coos River at MP 11.13R. Due to the soft silts and clays located at the exit and entry points proposed for the Coos River crossing, the 2017 GeoEngineers report states:

The hydraulic fracture and drilling fluid surface release model indicates the risk of drilling fluid surface release is high along the first approximately 250 feet of the drill path. The risk becomes

[264] *See Revised HDD Feasibility Evaluation*, 81.
[265] *See Revised HDD Feasibility Evaluation*, 16.
[266] *Id.* at 85.
[267] *See Revised HDD Feasibility Evaluation*, 61; *See Revised HDD Feasibility Evaluation*, 156.
[268] *Id.*

CO28-160 See response to similar comments from the Western Environmental Law Center.

CO28-161 See response to similar comments from the Western Environmental Law Center.

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low from the northern edge of the Coos River Highway and across Coos River to approximate station 17+00. The risk becomes high within approximately 150 feet of the exit point.[269]

Further, the 2017 GeoEngineers report in Table 4 establishes relative risk in terms of factor of safety from less than 1 (Very High Risk) to greater than 2 (Low Risk). The report cautions that the factors of safety "drop significantly," in other words demonstrate an increased risk, when the HDD passes through certain soil types:

The factors of safety, however, drop significantly when the HDD passes through the fat clay, organic silt and clay, and shallow sandy silt units as shown in Figure 6 between Stations 4+00 (Entry) and 7+00 and 17+00 and 20+00 (Exit). Figure 6 also shows the factors of safety against hydraulic fracture generally decrease as the HDD progresses towards the exit point as the required drilling fluid pressure increases with length.[270]

The 2017 GeoEngineers report describes how HDD alignment through fat clay soils is "typically more challenging than in other non-cohesive soils" and the potential for hydraulic fracture and drilling fluid surface release increases dramatically.[271] The report further concludes that:

It is our opinion that there is a relatively high risk of hydraulic fracture and drilling fluid surface releases along the first 500 feet and last 300 feet of the HDD, respectively.[272]

Additionally, the applicants do not provide adequate information regarding impacts to groundwater as a result of HDD. The September 2017 GeoEngineers report states:

During our borings, we were not able to measure groundwater levels due to the presence of drilling fluid. However, based on the observed relative moisture content of the samples, and the locations and elevations of the borings relative to the Coos River, we estimate that groundwater was at or near the ground surface at the time of drilling. We anticipate that groundwater levels will fluctuate with precipitation, site utilization and other factors. During heavy prolonged precipitation, and probably during most of the winter months, we expect that groundwater will be near or at the surface of the site.[273]

The applicant provides very limited details regarding how potential sediment pollution as a result of developing the temporary work areas and other construction activities associated with the HDD crossing will be minimized:

[269] Coos River HDD Pacific Connector Gas Pipeline Project. GeoEngineers. 1 September 2017. P. ES-1. PCP Part 2 Appendix B. P. 1471.
[270] Coos River HDD Pacific Connector Gas Pipeline Project. GeoEngineers. 1 September 2017. P. 9. PCP Part 2 Appendix B. P. 1480.
[271] Coos River HDD Pacific Connector Gas Pipeline Project. GeoEngineers. 1 September 2017. P. 13. PCP Part 2 Appendix B. P. 1484.
[272] Coos River HDD Pacific Connector Gas Pipeline Project. GeoEngineers. 1 September 2017. P. 13. PCP Part 2 Appendix B. P. 1484.
[273] Coos River HDD Pacific Connector Gas Pipeline Project. GeoEngineers. 1 September 2017. P. 5. PCP Part 2 Appendix B. P. 1476.

To reduce the potential for migration of sediment off site and into adjacent receiving waters during HDD operations, we recommend that state and local regulations be followed during and after construction operations. Proper BMP should be implemented in accordance with the PCGP Project's Erosion Control and Revegetation Plan (ECRP).[274]

The DEIS should fully evaluate the potential for a frac-out and BMPs to address sediment pollution from the applicants.

F. Removal of Riparian Vegetation

Construction of the pipeline would require removal of riparian vegetation across a wide construction easement, which would increase stream temperatures. Removal of riparian vegetation increases stream temperature by decreasing shade, which is particularly problematic for numerous streams within the Coos Subbasin that have salmon and steelhead spawning use, core cold water habitat use, salmon and trout rearing and migration use, or migration corridor use. The DEIS does not provide specific information about baseline temperatures in streams where riparian vegetation would be removed. CO28-162

Removal of riparian vegetation has the potential to both reduce shade and increase sedimentation. Increased sedimentation can impact interactions between surface water and groundwater by decreasing porosity in the hyporheic zone, resulting in reduced cool water inputs to streams. [275] Further, as stream temperature increases, dissolved oxygen levels decrease. Removing riparian vegetation also decreases Large Woody Debris that is an important component of stream morphology and habitat for aquatic species. Both the Coos River and Coos Bay are already impaired for temperature, sedimentation, and dissolved oxygen.

The Coos Subbasin supports habitat for threatened and endangered species listed under the ESA that are sensitive to temperature, sedimentation, and dissolved oxygen levels.

DEQ in its denial of the 401 certification for the project specifically identifies the removal of effective riparian shade as a factor for its denial, stating:

Given the incomplete thermal impact assessment and the lack of thermal mitigation plan to restore effective shade DEQ is unable to determine that JCEP's operation of the pipeline will comply with Oregon's temperature standard.[276]

The DEIS should full evaluate the direct, indirect, and cumulative effects of riparian vegetation removal at stream crossings within the Coos Subbasin.

[274] Coos River HDD Pacific Connector Gas Pipeline Project. GeoEngineers. 1 September 2017. P. 18. PCP Part 2 Appendix B. P. 1489.
[275] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-20.
[276] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 68.

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CO28-162 Section 4.5.2 address the issues noted including sedimentation, temperature, dissolved oxygen, and large woody debris effects from stream crossings. The 401 water quality certification is a State requirement and is beyond the scope of the EIS. It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations or OARs. We assume that the State would determine if the Project is in compliance with the State requirements during their review of Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all federal and applicable federally delegated permits. (Also see response to SA2-423 for mitigative riparian vegetation plantings and SA-240 concerning state permits.)

G. Roads

The applicants propose construction of temporary access roads (TARs) at 10 locations impacting 3.8 acres and construction of 15 permanent access roads (PARs) impacting 2.16 acres.[277] As the project continues to change throughout the public process, impacts to streams may be significantly altered as well. The applicant does not provide site-specific details to minimize impacts of temporary or permanent road construction to waterways beyond general descriptions of BMPs. Not only is road construction inadequately described, but the measures to prevent significant sedimentation and turbidity in streams are neither site-specific nor reliable.

In DEQ's denial of the 401 certification for the project, the agency identifies multiple locations where the applicant has not identified ownership of access roads that they propose to use. Specifically, DEQ lists Logging Spur 6.64R-7.34R, Carlson Heights Road 7.34R-7.44R, Willanch Slough 8.44R, and Logging Spur 8.17R as access roads proposed for use by the applicant where the ownership is not identified.[278] The DEIS should require that all access roads proposed for use by the applicant are identified and evaluated. Further, the DEIS should include information about the current status of all proposed access roads. CO28-163

The DEIS cannot rely upon future analysis to determine now how construction of permanent or temporary roads will impact wetlands, streams, and rivers. The DEIS should require specific design details and technical support for each TAR and PAR to determine whether new permanent and temporary roads will be hydrologically disconnected to waterbodies and in compliance with state and federal laws. The DEIS should require the applicant to provide selection criteria it will use to propose new roads that avoid impacts to waterways. The DEIS should also require information regarding the specific location with GPS coordinates for all road maintenance treatments the applicant proposes to implement to protect water quality on all access roads that are currently hydrologically connected to waterbodies. CO28-164

H. Hydrostatic Testing

The applicant proposes to use the Coos Bay-North Bend Water Board as the source of hydrostatic testing water within the Coos Subbasin.[279] Water withdrawals from the Coos Subbasin for hydrostatic testing and other related uses should be carefully reviewed in the DEIS to evaluate the direct, indirect, and cumulative impacts on water quality. The applicant provides minimal information regarding the source and discharge of hydrostatic testing water. Not only would these water withdrawal impact existing water rights, but reducing flows can also impair water quality, in violation of water quality standards.[280] Further, in DEQ's denial of the 401 certification, the agency notes that the applicant has failed to submit an application for Individual CO28-165

[277] Pacific Connector Pipeline Resource Report 1 General Project Description. p. 31. PCP Part 2 Appendix B 8 May 2018. p. 329.
[278] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 37.
[279] Pacific Connector Pipeline Resource Report 1 General Project Description. 8 May 2018. P. 58. PCP Part 2 Appendix B from DEQ 8 May 2018. P. 352.
[280] PUD No. 1 of Jefferson Cty v. Washington Dept. of Ecology. 511 U.S. 700 (1994). https://www.law.cornell.edu/supct/html/92-1911.ZO.html.

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CO28-163 The requested information is disclosed in section 4.10 of the EIS.

CO28-164 The assessment of sediment from roads to streams as analysis in the EIS is adequate to make determinations of effects to water per the requirements of NEPA. We assessed the project effects and indicated that there would be sediment runoff from roads used by the project, especially where roads cross streams. While some road runoff would occur, the BMPs in place would be adequate to keep the effects to water to a minimum. The Applicant has developed plans, including the ECRP and *Transportation Management Plan*, that would be implemented to control potential runoff and erosion to streams. These plans include requirements that all permit requirements be followed which would include those designed by the State to maintained water quality through the 401 certificate requirements. Construction BMPs for roads in areas of potential road erosion would generally be employed as discussed in section 4.2.2.2. See response to comment SA2-44 for more details.

The 401 water quality certification is a State requirement and is beyond the scope of the EIS. It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations or OARs. We assume that the State would determine if the Project is in compliance with the State requirements.

CO28-165 Hydrostatic testing and its potential effects are addressed in the EIS. It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations. We assume that the State would determine if the Project is in compliance with the State requirements during their review of the Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all applicable federal and federally delegated permits.

Industrial Water Pollution Control Facility Permit for the proposed discharges of hydrostatic testing wastewater that must include the location of each point of discharge.[281]

I. South Coast Basin – Coquille Subbasin

The South Coast Basin stretches across 1.9 million acres and consists of the Coos, Coquille, Sixes, Chetco, and part of the Smith subbasins.[282] The proposed pipeline route would cross through the Coos and Coquille subbasins. Impacts to the Coos subbasin are discussed above. The Coquille subbasin drains 1,058 square miles and the Coquille is the longest river in the South Coast Basin.[283] Waterways in the Coquille subbasin are impaired for dissolved oxygen, sedimentation, temperature, habitat modification, and biological criteria. In 1994, DEQ established a TMDL for the Coquille River for dissolved oxygen.[284]

The applicant proposes to cross multiple streams within the Coquille subbasin that are already impaired for multiple water quality parameters, including but not limited to dissolved oxygen, temperature, biological criteria, and sedimentation.

Table 2. 303(d) Listings for Streams Crossed by Pacific Connector Pipeline in the South Coast Basin – Coquille River Subbasin[285]

Waterbody Crossed by Pipeline	Dissolved Oxygen	Habitat Modification	Temperature	Biological Criteria	Sedimentation	Turbidity
Belieu Creek			X			
Big Creek		X	X		X	
Coquille River			X		X	X
East Fork Coquille River	X	X	X	X	X	
Elk Creek	X		X	X	X	
Middle Creek	X		X	X		
Middle Fork Coquille River	X	X	X		X	
North Fork Coquille River	X	X	X	X	X	X
Rock Creek	X	X	X	X	X	

[281] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. Information Request. P. 14 of 15.

[282] South Coast Basin Report. 2016. Oregon DEQ.
[283] Coquille River & Estuary Water Quality Report. Total Maximum Daily Load Program. Oregon DEQ. March 1994. https://www.oregon.gov/deq/FilterDocs/scCoquilleRiverTMDL.pdf. P. 1.
[284] Coquille River & Estuary Water Quality Report. Total Maximum Daily Load Program. Oregon DEQ. March 1994. https://www.oregon.gov/deq/FilterDocs/scCoquilleRiverTMDL.pdf. P. 3.
[285] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.

The Coquille subbasin supports multiple native fish species, including coho salmon, winter steelhead, fall chinook, spring chinook, coastal cutthroat trout, rainbow trout, and green and white sturgeon.[286] The Oregon Coast coho ESU was listed as a threatened species under the ESA in 1998.[287] According to the Oregon Coast coho 2012 Recovery Plan, the primary threats to the species include reduced amount and complexity of habitat as well as degraded water quality.[288] The 2007 Coquille River Subbasin Plan specifically points to water quality impairments from sedimentation and temperature as threats to Oregon Coast coho:

Excessive sedimentation from erosion in the watershed was identified as a potential cause for concern by the Soil and Water Conservation District (1983) and in the Preliminary Statewide Nonpoint Source Assessment (ODEQ 1988 in CWA 1997). Elevated turbidity and sediment loads in all zones can be attributed to the effects of soil disturbing activities such as management practices associated with road building, timber harvest, agriculture and active bank erosion above the head of tide.[289]

Further, the 2007 Coquille River Subbasin Plan also identifies temperature as an existing water quality impairment that threatens salmonids:

Warm season water temperatures appear to be one of the most critical, potential limiting factors in the Coquille drainage: 21 out of the 25 303(d) listed stream segments are listed for temperature. In addition, elevated water temperatures work in concert with other limiting factors to exacerbate their impacts. Salmonids and some amphibians appear to be of the most temperature-sensitive species. Stream temperatures during the salmonid spawning, incubation and emergence life stages are desirable, but are elevated during the summer rearing life stage.[290]

Additionally, the North and South Forks of the Coquille River were identified as Tier 1 Key Watersheds under the Northwest Forest Plan that "serve as refuge areas critical for maintaining and recovering habitat for at-risk stocks of anadromous salmonids on federally administered land (CWA 1997)."[291]

1. Stream Crossings

All of the proposed stream crossings within the Coquille Subbasin would use the dry open cut method. The DEIS should provide a comprehensive environmental review and require site-

CO28-166

[286] "Chapter 2: The Coquille Fishery." Coquille Watershed Action Plan. 16 May 2003. https://www.coquillewatershed.org/wp-content/uploads/2016/02/CHAP2.pdf.
[287] Oregon Coast Coho Salmon Recovery Plan Summary. NOAA Fisheries. December 2016. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/oregon_coast/oc_coho_plan_exec_summary_12_16.pdf.
[288] Oregon Coast Coho Salmon Recovery Plan Summary. NOAA Fisheries. December 2016. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/oregon_coast/oc_coho_plan_exec_summary_12_16.pdf. P. 6.
[289] Coquille River Subbasin Plan. NOAA Fisheries. June 2007. https://www.coquillewatershed.org/wp-content/uploads/2017/01/CoquilleRiversub-basinplan.pdf. P. 29.
[290] Coquille River Subbasin Plan. NOAA Fisheries. June 2007. https://www.coquillewatershed.org/wp-content/uploads/2017/01/CoquilleRiversub-basinplan.pdf. P. 29.
[291] Coquille River Subbasin Plan. NOAA Fisheries. June 2007. https://www.coquillewatershed.org/wp-content/uploads/2017/01/CoquilleRiversub-basinplan.pdf. P. 18.

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CO28-166 The assessment of sediment from roads to streams as analysis in the EIS is adequate to make determinations of effects to water per the requirements of NEPA. The FWS Stream Crossing Risk Analysis Matrix assessment was applied to all fluvial stream crossings to determine issues that may arise at specific individual crossing. This analysis was done for all fluvial streams crossing of the route independent of fish presence. They developed varied methods of construction and restoration approaches and BMPs to address the potential issues of concern at crossings depending on risk level determined through risk matrix analysis. Additionally, the Applicant would conduct pre-construction surveys of sites that did not have access to confirm level of risk and would adjust crossing methods as needed based on final risk determined. Higher risk stream crossing would have additional actions taken to reduce potential for adverse effects to the stream channel. They have developed site-specific crossing plans for stream crossing that were requested on Forest Service and BLM administered lands as mandated by these federal agencies. During construction an EI would be on site to ensure that actions designated in plans are implemented. They have monitoring plans for the crossing sites as well to identify where specific crossing issues may arise post construction and stated they would take remedial actions if needed based on permit requirements. There is no federal requirement to develop site-specific crossing plans on private lands. The State during their permitting process can make additional requirements as they determine are needed to meet their permit standards.

specific plans for each stream crossing, particularly for those crossings identified as moderate or high risk. Further, the DEIS should require a topographic survey, longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes for each stream crossing. CO28-166 cont.

As demonstrated in the table below, the applicant identifies seven stream crossings in the Coquille Subbasin as Level 1 (moderate) risk of channel migration, avulsion, and/or scour. Two stream crossings within the subbasin are identified as a Level 2 (high risk) of channel migration, avulsion, and/or scour (Middle Creek and South Fork Elk Creek).

Table 3. Moderate and High Risk Stream Crossings in the Coquille Subbasin

Waterbody crossed by pipeline	Level 1 (moderate) risk of channel migration, avulsion, and/or scour	Level 2 (high) risk of channel migration, avulsion, and/or scour
North Fork Coquille River (MP23.06)	X	
Middle Creek (MP 27.04)		X
Trib. To E Fork Coquille River (MP 28.86)	X	
East Fork Coquille River	X	
Elk Creek	X	
South Fork Elk Creek		X
Upper Rock Creek (MP 44.21)	X	
Deep Creek (MP 48.27)	X	
Middle Fork Coquille River (MP 50.28)	X	

The DEIS should fully evaluate the direct, indirect, and cumulative effects of stream crossings, particularly those identified as moderate and high risk. For example, there is no site-specific analysis for Middle Creek or the South Fork of Elk Creek, which are both identified as high risk sites for channel migration, avulsion, and/or scour. CO28-167

Limited detail is provided regarding the methods proposed for the North Fork and East Fork Coquille River crossings as well as methods to mitigate sediment pollution. The DEIS should comprehensively analyze potential impacts to water quality, including but limited to increased stream temperature as a result of removing riparian vegetation, increased sedimentation, decreased dissolved oxygen, or degraded habitat.

In addition to the potential for increased erosion, channel migration, avulsion, and/or scour as a result of pipeline crossings, many of the proposed crossings cut through waterbodies that are already impaired for sedimentation. Specifically, the North Fork of the Coquille, East Fork of the

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CO28-167 See response to comment CO28-166.

Coquille, Elk Creek, Middle Fork of the Coquille, and Rock Creek are all water quality limited for sedimentation and also have at least a moderate risk of channel migration, avulsion, and/or scour.

Channel modifications that increase sedimentation can decrease the depth and frequency of pools, which decreases the assimilative capacity for thermal loading of a stream. Elk Creek, East Fork of the Coquille, Middle Creek, Middle Fork Coquille River, North Fork Coquille River, and Rock Creek are all impaired for temperature.[292]

CO28-167 cont.

Proposed activities to conduct dry open cut technology have the potential to increase sedimentation, modify habitat, decrease dissolved oxygen, and impair the aquatic habitat.

2. Removal of Riparian Vegetation

The proposed action would likely cause stream temperature increases by removing riparian vegetation across a wide construction easement. Removing riparian vegetation will increase water temperature by decreasing shade in numerous streams identified as having salmon and steelhead spawning use, having core cold water habitat use, having salmon and trout rearing and migration use, or having migration corridor use. Further, removing riparian vegetation also decreases Large Woody Debris that is an important component of stream morphology and habitat for aquatic species.

CO28-168

The Coquille River already has a TMDL for dissolved oxygen. The proposed pipeline would cross the East Fork, Middle Fork, and North Fork of the Coquille which are impaired for dissolved oxygen, as well as Elk Creek, Middle Creek, and Rock Creek.

Not only is riparian vegetation critical for water quality, but removing riparian vegetation has direct, indirect, and cumulative impacts on threatened salmonids. Specifically, NOAA Fisheries identifies protection of stream buffers and riparian forests as a priority action to protect Oregon Coast coho in the Coquille subbasin:

Improve timber management activities, including road management, by protecting riparian forests and providing stream buffers sufficient for OC coho salmon recovery through protection and enhancement of shade to reduce stream temperatures and improve water quality.[293]

The DEIS should fully evaluate the direct, indirect, and cumulative effects of removing riparian vegetation in the Coquille subbasin.

[292] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.
[293] 6.3.5 Strategies and Actions for the Mid-South Coast Stratum. ESA Recovery Plan for Oregon Coast Coho Salmon. NOAA Fisheries. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/oregon_coast/final_mid-south_coast_stratum.pdf. P. 7.

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CO28-168 See response to comment SA2-86.

J. Umpqua Basin

The South Umpqua fifth-field watershed is 141,575 acres and begins at the confluence of the South Umpqua River and Elk Creek and flows 28 miles to the confluence with Cow Creek.[294] The proposed pipeline would enter the South Umpqua watershed with a crossing at Olalla Creek-Lookingglass Creek at pipeline milepost 55.9 and cross approximately 85 streams until leaving the watershed with a crossing of Upper Cow Creek.

The South Umpqua is impaired for temperature, dissolved oxygen, sediment/turbidity, and habitat modification.[295] These water quality parameters would be both directly and indirectly impacted by the proposed activities. There are at least 13 different waterways that are 303(d) listed for temperature, sedimentation, biological criteria, habitat modification, and dissolved oxygen within the South Umpqua watershed.[296] In addition to statewide numeric and narrative criteria, the Umpqua watershed has basin-specific water quality standards for turbidity, pH, and total dissolved solids.[297]

Table 4. 303(d) Listings for Streams Crossed by Pacific Connector Pipeline in the South Umpqua Watershed

Waterbody Crossed by Pipeline	Dissolved Oxygen	Habitat Modification	Temperature	Biological Criteria	Sedimentation
Bilger Creek	X				
Days Creek	X	X	X		
East Fork Cow Creek	X		X		
Fate Creek			X		
Kent Creek		X	X		
North Myrtle Creek	X	X	X	X	X
Olalla Creek			X	X	X
Rice Creek		X	X		
Saint John Creek			X		
Shields Creek				X	
South Myrtle Creek	X		X	X	X
South Umpqua River	X	X	X	X	X

[294] South Umpqua River Watershed. Institute for Natural Resources. Oregon State University. http://oregonexplorer.info/content/south-umpqua-river-watershed.
[295] Umpqua Basin Status Report and Action Plan. Oregon DEQ. 30 July 2014. https://www.oregon.gov/deq/FilterDocs/BasinUmpquaAssess.pdf.
[296] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.
[297] OAR 340-041-0326.

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Wood Creek	X		X		

Additionally, the project area within the South Umpqua watershed includes designated critical habitat for threatened Oregon Coast Coho listed under the ESA. The 2014 DEIS acknowledged that the project is likely to adversely affect Oregon Coast Coho and its critical habitat.[298] Fish use designations for the Umpqua, as identified by DEQ, include salmon and steelhead spawning, core coldwater habitat, and salmon and trout rearing and migration use.[299,300] The South Umpqua River is also designated as a Tier 1 Key Watershed under the Northwest Forest Plan. Key Watersheds serve as strongholds or potential strongholds for Oregon Coast coho. The Northwest Forest Plan states of Key Watersheds:

Refugia are a cornerstone of most species conservation strategies. They are designated areas that either provide, or are expected to provide, high quality habitat. A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stock of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat as well as areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat will have a high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program.[301]

1. Stream Crossings

According to the DEIS, the applicant proposes to cross 68 waterways in the South Umpqua Subbasin.[302] As part of the DEQ Joint Permit Application, the applicant proposed to cross 85 waterways within the watershed.[303] Many of the proposed crossings are waterways that are already impaired for dissolved oxygen, habitat modification, temperature, biological criteria, and sedimentation.

In its denial of the 401 certification for the project, DEQ identifies the likelihood of violating state water quality standards as a result of proposed stream crossings throughout the pipeline route, including waterway crossings in the South Umpqua Subbasin. Specifically, DEQ states:

Many of the proposed dry open-cut crossings occur in headwater streams that are tributaries to fish-bearing streams lower in the watershed. Headwater streams provide a critical source of cold water particularly in summer months when flows decline and a higher fraction of base flow is derived from subsurface groundwater. In addition, JCEP proposes many waterbody crossings at streams listed as impaired for temperature on Oregon's 303(d) list of impaired waterbodies. Dewatering actions proposed by JCEP would reduce the volume of cold groundwater available

[298] DEIS at 4-644, 4645.
[299] See Subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Figure 320A Fish Use Designations, Umpqua Basin. https://www.oregon.gov/deq/Rulemaking%20Docs/figure320a.pdf.
[300] See Subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Figure 320B Salmon and Steelhead Spawning Use Designations, Umpqua Basin. https://www.oregon.gov/deq/Rulemaking%20Docs/figure320b.pdf
[301] Northwest Forest Plan at B-18.
[302] 2019 DEIS at 4-274.
[303] See Table A.2-2.

for hyporheic exchange in the reach below each waterbody crossing. This reduction in groundwater exchange below crossings would reduce the assimilative capacity for thermal loading. JCEP proposes to alter groundwater flow at numerous stream to construct its pipeline. Many of these streams are currently impaired for temperature. For example, at pipeline stream crossing at Milepost 58.78, Ollala Creek is limited for temperature year round and is under an approved TMDL. Similarly, DEQ has placed Rice Creek (Milepost 65.76), South Umpqua River (Milepost 71.27), North Myrtle Creek (Milepost 79.12), South Myrtle Creek (Milepost 81.19), and many others on the 303(d) list for temperature. These streams are under an approved temperature TMDL.[304]

Proposed activities to conduct dry open cut technology have the potential to increase sedimentation, modify habitat, decrease dissolved oxygen, and impair the aquatic habitat. The DEIS identifies ten total stream crossings throughout the pipeline route that are Level 2 (high potential for migration, avulsion, or scour). This list includes five crossings within the South Umpqua watershed: Olalla Creek, western crossing of the South Fork Umpqua River, North Myrtle Creek, South Myrtle Creek, and the eastern crossing of the South Fork Umpqua River.[305]

The DEIS should require a comprehensive environmental review for each stream crossing, particularly for those crossings identified as moderate or high risk. Further, the DEIS should require a topographic survey, longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes for each stream crossing. CO28-169

2. South Umpqua River Crossings

Specific to the South Umpqua, the applicant proposes to use Direct Pipe technology for the first crossing of the South Umpqua River near Milepost 71 concurrently with the crossing of I-5. The applicant then proposes to cross the South Umpqua a second time at MP 94.73 near Milo using a diverted open-cut method. Direct Pipe technology is a new technology and, according to the applicants, "is still in its infancy with respect to construction and wide-spread adoption."[306] The DEIS should closely evaluate the feasibility of this new technology and potential problems that may not be identified by the applicants. CO28-170

Regarding the potential release of drilling fluid directly into the South Umpqua River, the applicant states:

Fractures and voids in the rock, if encountered, could result in a loss of fluid (formational fluid loss) into the subsurface. The lost slurry or lubrication fluid could then potentially emerge at the ground surface or within the South Umpqua River and/or sensitive area as a slurry surface release. We believe the risk of formational fluid loss to be low to moderate. We judge the risk of

[304] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 66.
[305] 2019 DEIS at 4-108.
[306] Appendix J.2 Direct Pipe Technology Overview Memo I-5/South Umpqua Direct Pipe Feasibility Evaluation. P. 3. 8 May 2018 JPA. PCP Part 2 Appendix B 8 May 2018 P. 1800.

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CO28-169 See response to comment CO28-166.

CO28-170 The risks of direct pipe crossings are addressed relative to sediment in section 4.5.2. Quantities of drilling fluid would be low and risk of substantial leaks into streams would remain low. There are contingency plans in place to address potential fluid leaks that would minimize the risk of drilling fluid leaks from this proposed method.

slurry surface release resulting from formational fluid risk to be low, provided that the contractor responds rapidly and appropriately to unexpected changes in fluid pressures during mining.[307]

CO28-170 cont.

The DEIS should comprehensively evaluate the direct, indirect, and cumulative effects of pollution from Direct Pipe Technology discharged into the South Umpqua River. This is even more important because the South Umpqua River is already water quality limited for dissolved oxygen, habitat modification, temperature, biological criteria, and sedimentation.[308]

According to the 2013 Umpqua Basin Report from DEQ:

The South Umpqua River at HWY 42 (Winston) shows a decreasing trend in water quality. Temperature, bacteria, nutrients and fine sediment have been identified as pollutant stressors that affect fish and other aquatic life throughout the basin. TMDLs were approved by EPA for bacteria, temperature, algae/aquatic weeds, dissolved oxygen and pH for the Umpqua Basin in 2007.[309]

The use of a diverted open-cut method to cross the South Umpqua River combined with removal of riparian vegetation to create the 75-foot clear-cut buffer will likely result in increased temperature, increased sedimentation, and degraded habitat and biological conditions in violation of state water quality standards.

CO28-171

K. Rogue Basin

The Rogue Basin stretches 3.3 million acres in southwestern Oregon and northern California. According to the 2012 303(d) list, waterbodies in the Rogue watershed do not meet state water quality standards for temperature, dissolved oxygen, sedimentation, bacteria, pH, and nuisance weeds and algae.[310] The table below lists the waterbodies in the Upper Rogue sub-watershed (HUC 17100307) that the applicants propose to cross that do not meet water quality standards for dissolved oxygen, temperature, and sedimentation. These proposed crossings include: Big Butte Creek, Indian Creek, Lick Creek, Little Butte Creek, Trail Creek, and the Rogue River. Additionally, Little Butte Creek and the Rogue River are also impaired for multiple toxics, including but not limited to cadmium, selenium, mercury, nickel, silver, and zinc.[311]

[307] Appendix J.2 Direct Pipe Technology Overview Memo 1-5/South Umpqua Direct Pipe Feasibility Evaluation. P. 8, 8 May 2018 JPA, PCP Part 2 Appendix B 8 May 2018 P. 1815.
[308] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.
[309] Umpqua Basin Report. Oregon DEQ. 2 June 2013. P. 145.
[310] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.
[311] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.

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CO28-171 It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations. We assume that the State would determine if the Project is in compliance with the State requirements during their review of the Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all applicable federal and federally delegated permits.

Table 5. 303(d) Listings for Streams Crossed by Pacific Connector Pipeline in the Rogue Basin[312]

Waterbody Crossed by Pipeline	Dissolved Oxygen	Habitat Modification	Temperature	Biological Criteria	Sedimentation
Big Butte Creek	X		X		X
Indian Creek	X		X		
Deer Creek			X		X
Lick Creek	X			X	
Little Butte Creek	X		X		X
Trail Creek	X		X		X
West Fork Trail Creek	X		X		X
Rogue River	X		X		X

The Rogue Basin supports coho salmon, spring chinook salmon, fall chinook salmon, summer steelhead, winter steelhead, cutthroat trout, Pacific lamprey, green sturgeon, and other native freshwater species. In 1997, the Southern Oregon/Northern California Coast (SONCC) coho salmon were federally listed as threatened.[313] The Rogue Basin TMDL states:

Urbanization, agriculture, water withdrawals, warm water temperatures, and loss of stream/floodplain connectivity in the greater Rogue River Basin inhibit the recovery of coho salmon (USFS 1995).[314]

Further, the 2014 Southern Oregon/Northern California Coast (SONCC) Coho Recovery Plan identifies impaired water quality as one of the key limiting stressors for the Upper Rogue River population.[315] Among six high priority recovery actions, the Recovery Plan identifies increasing Large Woody Debris as a priority recovery action. The proposed pipeline route would cross waterbodies that support threatened SONCC or have high Intrinsic Potential to support habitat.[316]

[312] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.

[313] Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 1-6. https://www.oregon.gov/deq/FilterDocs/rogueChapter1andExecutiveSummary.pdf.

[314] Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 1-8. https://www.oregon.gov/deq/FilterDocs/rogueChapter1andExecutiveSummary.pdf

[315] "Upper Rogue River Population." Southern Oregon/Northern California Coast (SONCC) Coho Recovery Plan. NOAA Fisheries. 2014. P. 32-1.

[316] "Upper Rogue River Population." Southern Oregon/Northern California Coast (SONCC) Coho Recovery Plan. NOAA Fisheries. 2014. P. 32-3.

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1. **Stream Crossings**

With the exception of the proposed Rogue River crossing upstream from Shady Cove, all of the proposed stream crossings within the Rogue Basin will use the dry open cut method. The DEIS should comprehensively review the direct, indirect, and cumulative effects of these crossings and provide site-specific analysis for each proposed crossing.

The applicant identified seven stream crossings in the Rogue Basin as Level 1 (moderate) risk of channel migration, avulsion, and/or scour. The crossing of North Fork Little Butte Creek, which is already impaired for dissolved oxygen, temperature, and sedimentation, is identified as having a high risk of channel migration, avulsion, and/or scour. The DEIS should require site-specific information including, but not limited to the specific location of access roads, details of proposed blasting, and the location of temporary coffer dams. CO28-172

Table 6. Stream Crossings Identified with Moderate and High Risk of Channel Migration, Avulsion and/or Scour in the Rogue Basin

Waterbody crossed by pipeline	Level 1 (moderate) risk of channel migration, avulsion, and/or scour	Level 2 (high) risk of channel migration, avulsion, and/or scour	Bore	HDD
West Fork Trail Creek (MP 118.89)	X			
Canyon Creek (MP120.45)	X			
Rogue River (MP 122.65)				X
Deer Creek (MP 128.49)	X			
Neil Creek (MP132.12)	X			
Medford Aqueduct (MP 133.38)			X	
Lick Creek (MP 140.27)	X			
Salt Creek (MP 142.57)	X			
North Fork Little Butte Creek (MP 145.69)		X		
South Fork Little Butte Creek (MP 162.45)	X			

The 2015 FEIS from the previous iteration of the proposed pipeline specifically addressed the potential water quality impairments as a result of channel migration, avulsion, and/or scour. The 2015 FEIS states:

Fluvial erosion represents potential hazard to the proposed pipeline where streams are capable of exposing the pipe as a result of channel migration, avulsion, widening, and/or streambed scour. The principal hazard resulting from channel migration and streambed scour is complete or partial exposure of the pipeline within the channel from streambed and bank erosion or within the

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CO28-172 See response to comment CO28-166.

floodplain from channel migration and/or avulsion….two crossings were identified that require additional field reconnaissance; West Fork Trail Creek and North Fork Little Butte Creek.[317]

In addition to the potential for increased erosion, channel migration, avulsion, and/or scour as a result of pipeline crossings, many of the proposed crossings cut through water bodies that are already impaired for sedimentation. According to the 2008 Rogue Basin TMDL:

There are six segments in the Rogue River Basin that were listed in the 2004/2006 WQ Assessment as sedimentation impaired (Table 1.12 and Figure 1.10). The impairments were determined based on Oregon Department of Fish and Wildlife (ODFW) reporting that a high percentage of fine sediment was measured in most reaches during a 1994 survey. At the time of the writing of this TMDL, DEQ is in the process of developing a sedimentation assessment methodology that could be used for implementing the narrative sedimentation standard. When the methodology and associated guidance is completed, the agency will establish sedimentation TMDLs for those waterways on the 303(d) list. DEQ also intends to re-visit the Rogue River Basin sedimentation impairments when the temperature and bacteria TMDLs are reviewed, on a 5 year basis.[318]

CO28-172
cont.

Disturbances that change riparian vegetation, increase the rate or amount of overland flow, or destabilize a stream bank may increase the rates of stream bank erosion and result in sedimentation increases. Disturbances in the uplands that remove vegetation, reduce soil stability on slopes, or channel runoff can increase sediment inputs (DEQ 2003, DEQ 2007). Sediment created from upland erosion is delivered to a stream channel through various erosional processes. Wide mature riparian vegetation buffers filter sediment from upslope sources as well as stabilize stream banks from erosion. System potential riparian vegetation measured by percent effective shade is a surrogate measure that has been used in other TMDLs to address sedimentation (DEQ 2003).

Modifications to the stream channel, as a result of the proposed activities that can result in channel migration, avulsion, and/or scour, will also impact temperature. As described in the Rogue Basin TMDL, channel modifications that increase sedimentation can decrease the depth and frequency of pools, which decreases the assimilative capacity for thermal loading of a stream.[319]

Specifically, Little Butte Creek and the South Fork of Little Butte Creek are both listed as impaired for sediment.[320] The South Fork Little Butte Creek crossing is identified as a moderate risk for channel migration, avulsion, and/or scour while the North Fork Little Butte Creek is identified as high risk. At a minimum, the DEIS should require further field assessments and site-specific analysis for these high risk crossings in water bodies that are already impaired for sediment.

[317] FEIS at 4.3-36.
[318] Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 1-19. https://www.oregon.gov/deq/FilterDocs/rogueChapter1andExecutiveSummary.pdf.

[319] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-20.
[320] Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 1-20. https://www.oregon.gov/deq/FilterDocs/rogueChapter1andExecutiveSummary.pdf.

In its denial of the 401 certification for the project, DEQ identifies the likelihood of violating state water quality standards as a result of proposed stream crossings throughout the pipeline route, including waterway crossings in the Rogue Basin.

Further, the DEIS states that the project is likely to adversely affect designated critical habitat for coho salmon in the SONCC ESU because:

- failure of dry open-cut crossing would cause moderate or more severe habitat degradations in some crossing areas;
- increases in turbidity are expected to temporarily affect the water quality downstream from stream crossing sites during construction;
- food resources would potentially be affected over the short term by dry open-cut and diverted open-cut construction methods that would remove substrate and benthos at crossing sites;
- freshwater migration corridors would potentially be affected over the short term by dry open-cut and diverted open-cut construction methods that would create temporary barriers to in-stream movements; and
- approximately 17 acres of native riparian vegetation (forest, wetlands, unaltered, and nonforested habitats) and altered habitat would be removed during construction within riparian zones associated with designated critical habitat. Adverse effects on riparian zones associated with critical habitat would be long term or permanent depending on whether mid-seral riparian forests (7 acres) or LSOG riparian forests (2 acres) are removed.[321]

CO28-172 cont.

The DEIS should require a comprehensive environmental review for each stream crossing, particularly for those crossings identified as moderate or high risk. Further, the DEIS should require a topographic survey, longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes for each stream crossing.

2. Rogue River HDD Crossing

The applicant proposes to use Horizontal Directional Drilling (HDD) technology to cross the Rogue River at MP 122.65. The use of HDD also poses the risk of an unintended release of drilling fluid known as a frac-out. The DEIS fails to comprehensively disclose and analyze the likelihood and frequency of frac-out events. The State re-iterated these concerns in its 2017 scoping comments.[322] Additionally, the DEIS fails to conduct a numerical hydraulic fracture analysis, instead relying upon a qualitative analysis.[323] As part of the qualitative analysis supplied by the applicant, GeoEngineers identifies the presence of gravels and cobbles near the HDD entry point and cautions that:

CO28-173

[321] 2019 DEIS at 4-332.
[322] Stat of Oregon 2017 Scoping comments at 15.
[323] Rogue River HDD Pacific Connector Pipeline Project Jackson County, Oregon. 1 September 2017. P. 7. Pacific Connector Pipeline Part 2 Appendix B. P. 1578.

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CO28-173 As described in section 4.3.2.2 of the EIS, "To prevent an inadvertent release or address impacts should one occur, Pacific Connector developed its Drilling Fluid Contingency Plan for Horizontal Directional Drilling Operations." The plans in place to reduce the risk of frac-out and actions to be taken to eliminate or reduce impacts are summarized in section 4.5.2. A more specific discussion of HDD drilling and the potential for frac-out incidents is also included in this section including assessment of potential impacts to aquatic resources from frac-out. We assume that the State would determine if the Project is in compliance with the State requirements and OARs during their review of the Applicant's State permit applications. If the State chooses, it could make the requested requirements contingent for permit approval.

If cuttings are not effectively removed from the hole during HDD operations, pullback forces could be excessively high during pullback of the 36-inch-diameter product pipe, or the product pipe could become lodged in the hole. The failure to effectively remove cuttings from the hole could potentially result in failure of the HDD installation. Therefore, we recommend that the drilling contractor maintain drilling fluid returns at all times, and use appropriate means and methods (appropriate penetration rates, drilling fluid management, mechanical methods) to ensure that cuttings are adequately removed from the hole during the HDD process.[324]

Further, the qualitative assessment of the potential for a frac-out results in the following conclusion from GeoEngineers:

It is our opinion that there is a low risk of drilling fluid surface release along the proposed HDD profile, except within about 50 to 100 feet of the entry and exit points where the HDD profile passes through alluvial and colluvial soils, and the cover between the HDD profile and the ground surface is relatively thin. As is typical with most HDD installations, the risk of drilling fluid surface release within about 100 feet of the entry and exit points is relatively high.[325]

Additionally, the DEIS does not comprehensively review the direct, indirect, and cumulative impacts to groundwater as a result of HDD. The September 2017 GeoEngineers report states:

We did not measure groundwater levels upon completion of the borings because of the presence of drilling fluid in the holes at the time of drilling. We anticipate that groundwater levels will mimic the elevation of the Rogue River around 1,410 feet mean sea level (MSL). We anticipate that groundwater levels will fluctuate with precipitation, site utilization and other factors. During heavy prolonged precipitation, and probably during most of the winter months, we expect that groundwater will be near or at the surface of the site on the east side of the Rogue River. [326]

CO28-174

Merely "anticipating" impacts to groundwater is not a comprehensive and site-specific review of the potential consequences of a frac-out related to HDD crossing of the Rogue River. The DEIS identifies the Rogue River HDD crossing at MP 122.65 as a "high" sensitivity crossing to hyporheic zone alterations where water quality, including water temperature and dissolved oxygen, could be impaired.[327]

Further, the DEIS fails to adequately disclose the direct, indirect, and cumulative impacts of HDD crossing and potential frac-out for the Rogue, which is designated as a Wild and Scenic River from the boundary of Crater Lake National Park to approximately 20 miles upstream from the crossing and from the confluence with the Applegate River downstream to the Lobster Creek bridge. The DEIS at 4-547 states:
Indirect effects could occur if the pipeline crossing were to cause sedimentation that could run downstream and affect water quality of the federally designated Wild and Scenic River portion

CO28-175

[324] Rogue River HDD Pacific Connector Pipeline Project Jackson County, Oregon. 1 September 2017. P. 11. Pacific Connector Pipeline Part 2 Appendix B. P. 1582.
[325] Rogue River HDD Pacific Connector Pipeline Project Jackson County, Oregon. 1 September 2017. P. 12. Pacific Connector Pipeline Part 2 Appendix B. P. 1583.
[326] Rogue River HDD Pacific Connector Pipeline Project Jackson County, Oregon. 1 September 2017. P. 6. Pacific Connector Pipeline Part 2 Appendix B. P. 1577.
[327] 2019 DEIS at 4-113.

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CO28-174 The cited report (GeoEngineers' 2017 Horizontal Directional Drilling Design report for the Rogue River) addresses HDD feasibility at the site and presents reasonable assumptions about groundwater levels used in their analysis. Notably, the report found that the proposed crossing of the Rogue River can be installed successfully and that there is a low risk of drilling fluid surface release along the portion of the HDD path located beneath the Rogue River.

CO28-175 See response to comment CO28-173. Also, cumulative impacts of the Project combined with reasonably foreseeable projects are addressed in section 4.14.

of the Rogue River. However, the pipeline would cross the Rogue River using an HDD, which would avoid direct effects on this river. Also, while this segment of the Rogue River was found eligible for Wild and Scenic designation by the BLM Medford District (BLM 1995f), its river-related values are only protected on BLM-managed lands (approximately one mile from the pipeline crossing). The pipeline would not cross any protected segments of the Rogue River on BLM- managed lands. The values for which the river was found eligible are not expected to be affected by the pipeline construction and operation.[328]
The DEIS should fully evaluate the potential for a frac-out and BMPs to address water quality pollution, including but not limited to temperature, sediment, and dissolved oxygen from the applicants.

CO28-175 cont.

4. Medford Aqueduct Crossing

In addition to the dry open-cut methods and the HDD proposed for the Rogue River, the applicants also propose to bore below the Medford Aqueduct. The 31-inch Medford Aqueduct pipeline was constructed in 1927 and carries approximately 40 cubic feet per second of drinking water from Big Butte Springs to the City of Medford and communities within the Bear Creek watershed.[329] The DEIS should comprehensively evaluate the direct, indirect, and cumulative effects of construction of this crossing. The plan and profile for the Medford Aqueduct state that the depth of the aqueduct is unknown.[330] The DEIS should require more information regarding the depth of the bore and site-specific details to evaluate the potential direct, indirect, and cumulative impacts of the proposed pipeline crossing the main source of the City of Medford's drinking water.

CO28-176

5. Removal of Riparian Vegetation

The proposed action would cause stream temperature increases by removing riparian vegetation across a wide construction easement. Removing riparian vegetation will increase water temperature by decreasing shade in numerous streams identified as having salmon and steelhead spawning use, having core cold water habitat use, having salmon and trout rearing and migration use, or having migration corridor use.

Riparian vegetation is critical to overall stream health and water quality. Removing riparian vegetation, as proposed by the applicants, will likely impair water quality in violation of the Clean Water Act. As described in the Rogue Basin TMDL:

Near-stream vegetation disturbance/removal reduces stream surface shading via decreased riparian vegetation height, width and/or density, thus increasing the amount of solar radiation reaching the stream surface (shade is commonly measured as percent-effective shade or open sky percentage). Furthermore, forests even beyond the distance necessary to shade a stream can influence the microclimate, providing cooler daytime temperatures (Chen et al. 1999). Riparian

[328] 2019 DEIS at 4-547.
[329] "Big Butte Creek." Eagle Point Irrigation District. https://www.eaglepointirrigation.com/big-butte-creek.html.
[330] Pacific Connector Gas Pipeline Project. Plan and Profile – Medford Aqueduct. PCP A-B Part 7. 6 February 2018. P. 1.

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CO28-176 The draft EIS states that when crossing irrigation canals associated with Reclamation's Klamath Project, Pacific Connector committed to complying with Reclamation's Engineering and O&M Guidelines for Crossings – Bureau of Reclamation Water Conveyance Facilities (Canals, Pipelines, and Similar Facilities) unless otherwise described in the Klamath Project Facilities Crossing Plan (Appendix O of its POD). All crossings would require Professional Engineer–stamped design drawings approved by Reclamation prior to installation. See section 2.4.2.2.

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vegetation also plays an important role in shaping channel morphology, resisting erosive high flows, and maintaining floodplain roughness.[331]

Not only will removing riparian vegetation likely increase water temperature, but it is also likely to result in increased sedimentation. As stated in the Rogue Basin TMDL:

> Increased sediment loading can result from agricultural, logging and mining activities which can result in increased runoff, landslides, debris torrents and other mass wasting events. Lastly, removal of riparian vegetation can lead to bank instability and increased erosion.[332]

Further, removal of riparian vegetation that results in increased sedimentation can impact interactions between surface water and groundwater, further impairing streams for temperature. As stated in the Rogue Basin TMDL:

> Excess fine sediment can also decrease permeability and porosity in the hyporheic zone, greatly reducing hyporheic flow, and resulting in less cool water inputs (Rehg et al. 2005).[333]

Stream temperature is also closely related to dissolved oxygen levels. Removing riparian vegetation will not only increase stream temperature, but also likely result in decreased dissolved oxygen. As stated in the Rogue Basin TMDL:

> Stream temperature has a significant impact on the dissolved oxygen level in a stream in two ways. As stream temperatures decrease, the amount of oxygen that can remain dissolved in water increases, and as temperatures decrease the amount of oxygen consumed by biological processes decreases.[334]

Multiple streams that would be crossed by the pipeline are also impaired for dissolved oxygen (e.g. Big Butte Creek, Little Butte Creek, and the Rogue River). The Ninth Circuit Court of Appeals made clear that new dischargers may not add a pollutant into a water body that is water quality limited.[335]

Removing riparian vegetation also decreases Large Woody Debris that is an important component of stream morphology and habitat for aquatic species.

The Rogue Basin supports habitat for threatened and endangered species listed under the ESA that are sensitive to temperature, sedimentation, and dissolved oxygen levels. Specifically, the Upper Rogue provides habitat for threatened SONCC coho. Regarding the Upper Rogue River population of SONCC coho, NOAA Fisheries stated:

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[331] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-19.
[332] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-19.
[333] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-20.
[334] Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 1-18.
[335] See Friends of Pinto Creek v. United States Environmental Protection Agency, No. 05-70785, (9th Cir. Oct. 4, 2007).

> The most pervasive problem affecting coho salmon is water temperature. Very few reaches in the Upper Rogue River Sub-basin meet ODEQ (2008) water standards compatible with coho salmon recovery…Flow depletion reduces water volume and slows water velocity, thus promoting warming, stagnation, and depressed dissolved oxygen (D.O.) (Thompson and Fortune 1970). Nawa (1999) documented loss of coho salmon juveniles in Trail Creek due to flow depletion and low D.O. Little Butte Creek is similar to Trail Creek and has both low flow and D.O. problems.[336]

Further, regarding the Upper Rogue River population, the 2014 SONCC Recovery Plan states:

Poor pool frequency and depth throughout the Upper Rogue River basin (URWA 2006) are likely due to elevated levels of fine sediment partially filling pools, a lack of scour-forcing obstructions such as large wood, and in some reaches diminished scour due to channel widening.[337]

The DEIS should comprehensively evaluate the direct, indirect, and cumulative effects of removing riparian vegetation for pipeline construction and operation, particularly for waterways that are already impaired for pollutants such as temperature, sediment, and dissolved oxygen. The DEIS should also require information about baseline temperatures in streams that would suffer removal of riparian vegetation and stream shading. CO28-177

6. Road Construction

Runoff and sedimentation from roads is a major source of pollution to the streams of southwest Oregon. The Rogue Basin TMDL states:

Excessive summer water temperatures have been recorded in a number of tributaries. These high summer temperatures are reducing the quality of rearing and spawning habitat for chinook and coho salmon, steelhead and resident rainbow trout. The potential causes of high water temperatures in the Rogue River subbasins include urban and rural residential development near streams and rivers, reservoir management, irrigation water return flows, past forest management within riparian areas, NPDES regulated point sources, agricultural land use within the riparian area, water withdrawals, and road construction and maintenance.[338]

Increased sediment as a result of road construction, operation, and maintenance is also identified as a risk to threatened SONCC coho under the 2014 Recovery Plan:

> Sediment contribution from landslides and erosion occurs naturally in the Upper Rogue River basin; however, roads, timber harvest, and bank erosion following removal of

[336] "Upper Rogue River Population." Southern Oregon/Northern California Coast (SONCC) Coho Recovery Plan. NOAA Fisheries. 2014. P. 32-15.
[337] "Upper Rogue River Population." Southern Oregon/Northern California Coast (SONCC) Coho Recovery Plan. NOAA Fisheries. 2014. P. 32-17.
[338] "Chapter 2: Temperature." Rogue River Basin TMDL. Oregon DEQ. December 2008. P. 2-2.

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CO28-177 See response to comment SA2-86. Also, the effects of clearing on stream water quality parameters are addressed in section 4.3.2.

riparian vegetation have elevated fine sediment input. Excess fine sediment directly impacts coho salmon egg viability and can reduce food for fry, juveniles and smolts.[339]

The applicant proposes construction of temporary access roads (TARs) at 10 locations impacting 3.8 acres and construction of 15 permanent access roads (PARs) impacting 2.16 acres.[340] Not only is road construction inadequately described, but the measures to prevent significant sedimentation and turbidity in streams are neither site-specific nor reliable.

In its denial of the 401 certification for the project, DEQ specifically identifies inadequate information related to TARs and PARs in its rationale for denying the permit. The DEIS fails to disclose site-specific information or conduct adequate analysis for the water quality impacts of proposed TARs and PARs.

Within the Rogue Basin, DEQ provides a specific example where the applicant failed to disclose or provide critical information related to water impacts. According to DEQ's analysis, PAR 132.66 is located in a Potential Rapidly Moving Landslide Hazard Area and near landslides identified by aerial photography and LiDAR. DEQ states:

CO28-178

> Moreover, PCGP is proposing to reconstruct BLM's Beaver Springs road (BLM Noninv 32-2-36.A) by widening it. According to PCGP's Geologic Hazard Map, this BLM road identified for widening is located above a landslide area that drains to intermittent stream discharging into Dead Horse Creek. PCGP has not provided DEQ with design information regarding the need for the creation of fill slopes for this proposed new road in an area with unstable slopes. PCGP has not provided DEQ with design information for the reconstruction of the BLM road above unstable slopes. Has PCGP conducted a geotechnical investigation of this road- widening project? If performed, does this geotechnical investigation indicate the need for reinforced fill for this road- widening project? Where will PCGP discharge the post-construction stormwater for this PAR? Given the lack of design details, these questions surface for DEQ while reviewing PCGP's submittal.

As discussed in DEQ's review of PCGP's response to Comment 15, the management of stormwater discharge and the design of cut and fill slopes are important engineering considerations when constructing roads on steep and unstable slopes. The intent of DEQ's request for information on PCGP's selection criteria is to evaluate PCGP's efforts to minimize impacts to water quality from debris flows during new road construction. As noted below, PCGP should analyze the various options for accessing sections of the pipeline alignment for construction and operation as part of its efforts to address the National Environmental Protection Act requirements and, based on this analysis required by NEPA, determine the need to build new roads such as TAR 101.70 discussed above. To evaluate PCGP's efforts to avoid and minimize impacts to water quality, DEQ is requesting that PCGP provide its selection criteria for

[339] "Upper Rogue River Population." Southern Oregon/Northern California Coast (SONCC) Coho Recovery Plan. NOAA Fisheries. 2014. P. 32-17.
[340] Pacific Connector Pipeline Resource Report 1 General Project Description. p. 31, PCP Part 2 Appendix B 8 May 2018. p. 329.

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CO28-178 See response to comment CO28-164. Also, the Applicant would need to obtain NPDES permits for stormwater management. These permits would require the implementation of actions needed to insure adverse water quality conditions do not occur. We assume that the State would determine if the Project is in compliance with the State requirements during their review of Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all federal and applicable federally delegated permits.

determining the need and location of TARs and PARs that PCGP used in its alternative analyses to comply with NEPA. [341]

The DEIS fails to comprehensively analyze the management of stormwater discharge and the design of cut and fill slopes for many of the proposed PARs and TARs for the project. The applicant should have developed selection criteria for choosing both the need for and the location of new access roads for pipeline construction and operation to minimize impacts to water quality. The DEIS should also require information regarding the specific location with GPS coordinates for all road maintenance treatments the applicant proposes to implement to protect water quality on all access roads that are currently hydrologically connected to waterbodies. The DEIS should require specific design details and technical support for each TAR and PAR to determine whether new permanent and temporary roads will be hydrologically disconnected to waterbodies and in compliance with state and federal laws. The DEIS should require the applicant to provide selection criteria it will use to propose new roads that avoid impacts to waterways. CO28-178 cont.

7. Hydrostatic Testing

Potential sources of hydrostatic test water from the Rogue Basin include the Rogue River, the Medford Aqueduct, Eagle Point Irrigation, or the North Fork of Little Butte Creek.[342] The DEIS lists the Rogue River, Star Lake, the Medford Aquifer, Klamath River, and Lost River as potential sources for hydrostatic testing in Table 4.3.2.2-7.[343] The DEIS should comprehensively review the direct, indirect, and cumulative effects of water withdrawals from the Rogue Basin for hydrostatic testing and other uses. The applicant provides minimal information regarding the source and discharge of hydrostatic testing water. Not only would these water withdrawals impact existing water rights, but reducing flows can also impair water quality, in violation of water quality standards.[344] DEQ's denial of the 401 certification notes that the applicant has failed to submit an application for Individual Industrial Water Pollution Control Facility Permit for the proposed discharges of hydrostatic testing wastewater that must include the location of each point of discharge.[345] CO28-179

L. Upper Klamath and Lost River Subbasins

The Upper Klamath Basin covers approximately 5.6 million acres and includes six hydrologic sub-basins above Iron Gate dam. As stated in the Upper Klamath and Lost Subbasins TMDL:

The Klamath River basin is of vital economic and cultural importance to the states of Oregon and California, as well as the Klamath Tribes in Oregon; the Hoopa, Karuk, and Yurok tribes in California; the Quartz Valley Indian Reservation in California, and the Resighini Rancheria in

[341] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 49.
[342] Pacific Connector Pipeline Resource Report 1 General Project Description. 8 May 2018. P. 58. PCP Part 2 Appendix B from DEQ 8 May 2018. P. 352.
[343] 2019 DEIS at 4-110.
[344] PUD No. 1 of Jefferson Cty v. Washington Dept. of Ecology. 511 U.S. 700 (1994). https://www.law.cornell.edu/supct/html/92-1911.ZO.html.
[345] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. Information Request. P. 14 of 15.

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CO28-179 Hydrostatic testing and its potential effects are addressed in the EIS. It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations. We assume that the State would determine if the Project is in compliance with the State requirements during their review of the Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all applicable federal and federally delegated permits.

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California.... Historically, the Basin once supported vast spawning and rearing fishery habitat with cultural significance to the local Indian tribes. The watershed supports an active recreational industry, including activities that are specific to the Wild and Scenic portions of the river designated by both the states and federal governments in both Oregon and California.[346]

The proposed pipeline would enter the Upper Klamath watershed with a crossing of Spencer Creek at MP 171.07 and cross approximately 10 streams within the watershed. The Upper Klamath has TMDLs for Dissolved Oxygen, Chlorophyll a, pH, and Ammonia Toxicity.[347] These water quality parameters would be both directly and indirectly impacted by the proposed activities. Multiple streams crossed by the pipeline within the Upper Klamath subbasin are impaired for dissolved oxygen, temperature, habitat modification, biological criteria, sedimentation, and toxics.[348]

The headwaters of the Lost River are located in California and the sub-basin stretches across both Oregon and California.[349] Approximately 109 waterways would be crossed by the pipeline in the Lost River watershed. The Lost River subbasin also has TMDLs for Dissolved Oxygen, Chlorophyll a, pH, and Ammonia Toxicity.[350] Regarding water quality in the Lost River subbasin, DEQ states:

> High nutrient loading in the Lost River subbasin contributes directly to exceedances of the ammonia toxicity and nuisance phytoplankton water quality criteria. In addition, nutrient loading promotes the production of aquatic plants and algae (macrophytes, epiphyton, periphyton, and phytoplankton), resulting in exceedances of water quality criteria for dissolved oxygen (DO) and pH. Biochemical oxygen demand (BOD), in the water column and sediment, also contributes to the dissolved oxygen limitation.[351]

Table 7. 303(d) Listings for Streams Crossed by Pacific Connector Pipeline in the Upper Klamath and Lost River Subbasins

Waterbody Crossed by Pipeline	Dissolved Oxygen	Habitat Modification	Temperature	Biological Criteria	Sedimentation	Toxics
Klamath River	X	X	X		X	X
Clover Creek		X	X	X	X	
Spencer Creek		X	X	X	X	

[346] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf. P. 15.
[347] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf.
[348] Oregon's 2012 Integrated Report Assessment Database and 303(d) list. Oregon DEQ. https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp.
[349] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf.
[350] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf.
[351] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf. P. 92

Lake Ewauna	X					

Additionally, the Upper Klamath subbasin supports threatened and endangered species listed under the ESA, including the shortnose sucker, Lost River sucker, Bull trout, and Redband/Rainbow trout.[352] As discussed in more detail in Section VI, the proposed activities will likely create conditions deleterious to these threatened and endangered species, in violation of OAR 340-041-0007(10). According to the USFWS, factors that impact the persistence and abundance of Lost River and shortnose suckers include habitat fragmentation and "decreases in water quality associated with timber harvest, removal of riparian vegetation, livestock grazing, and agriculture practices."[353]

Regarding impacts of decreased water quality on threatened and endangered fish within the Upper Klamath and Lost River subbasins, DEQ states:

Water quality problems are of great concern because of their potential impact on native fish populations in the Klamath basin including the Shortnose sucker (*Chasmistes brevirostris*), Lost River sucker (*Deltistes luxatus*), and interior redband trout (*Oncorhynchus mykiss ssp.).* Both sucker species were listed as endangered under the Endangered Species Act in 1988, and water quality degradation has been identified as a probable major factor in their declines. Populations of listed sucker species in the main stem of the Lost River, and Tule Lake are small and consist primarily of adults. Suckers have been eliminated entirely from the middle portion of the main stem of the Lost River and Lower Klamath Lake (NRC 2004).[354]

1. Stream Crossings

The DEIS should provide a comprehensive environmental review for each stream crossing, particularly for those crossings identified as moderate or high risk. With the exception of the Klamath River crossing, all of the proposed crossings will use either a dry open cut method or a bore. The crossing of Clover Creek at MP 177.76 is identified as a Level 1 moderate risk of scour, channel migration, and/or avulsion. However, no site-specific analysis of this higher risk crossing is provided. The DEIS should require site-specific information including, but not limited to the specific location of access roads, details of proposed blasting, and the location of temporary coffer dams. Further, the DEIS should require a topographic survey, longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes for each stream crossing. CO28-180

Additionally, the applicant proposes to cross streams that are already impaired for dissolved oxygen, habitat modification, temperature, biological criteria, and sedimentation. Proposed activities to conduct dry open cut technology have the potential to increase sedimentation, modify habitat, decrease dissolved oxygen, and impair the aquatic habitat. Specifically, the

[352] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf. P. 30.
[353] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf. P. 32.
[354] Upper Klamath and Lost River Subbasins TMDL. Oregon DEQ. December 2017. https://www.oregon.gov/deq/FilterDocs/UpperKlamathandLostRiverTMDL.pdf. P. 96.

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CO28-180 See response to comment CO28-166.

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crossing of the Klamath River, Clover Creek, and Spencer Creek should be carefully evaluated because these waterways are already listed as impaired for multiple water quality parameters.

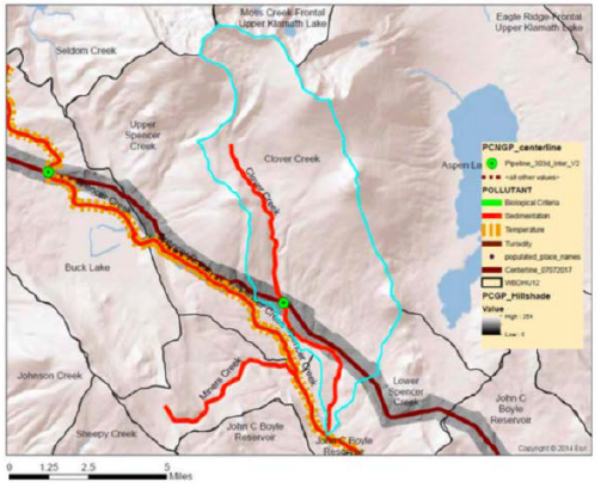
DEQ in its denial of the 401 certification for the project raises significant concerns regarding stormwater discharges near streams, particularly for the proposed permanent ROW that would cross or run parallel to 303(d) listed streams impaired for sediment and other pollutants. DEQ identifies Spencer Creek and Clover Creek as two examples within the Klamath and Lost River Subbasins. Specifically, DEQ states:

CO28-180 cont.

> Figure 10 shows one of several examples of the permanent ROW crossing or paralleling streams on the 303(d) list for sediment or crossing streams discharging to these sediment-listed streams. Based on its proposed conceptual approach for operating the ROW, the permanent ROW has the potential to discharge sediment at stream crossings. Ongoing increases in sediment loading to a waterbody that is listed on the 303(d) list for sediment in not allowed without either a TMDL allocation, or an implementation plan showing that there will be no increase in loading. OAR 340-41-0004(7)("Water quality limited waters may not be further degraded except in accordance with paragraphs (9)(a)(B), (C) and (D) of this rule." JCEP has not provided the analyses for the discharges that would occur at each slope breaker for each stream crossing. In addition, JCEP has not performed an analysis to demonstrate that the herbaceous area in the permanent ROW between the last slope breaker and stream is an effective BMP by itself and would not contribute to or cause a water quality standard violation, particularly near waterbodies that are not meeting standards for sediment. As noted in DEQ's September 7 (Page 11 of 15 of, Attachment B) and December 2018 (Page 66 – 68 of Attachment A) information requests, DEQ requested that JCEP evaluate the efficacy of these proposed BMPs using modeling. JCEP has not provided DEQ with this evaluation of the water quality impacts from this slope breaker discharge nor has it provided DEQ with the analysis of the proposed treatment for the discharge from slope breakers immediately upslope of a steam.[355]

[355] Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 38-39.

Figure 10: Pipeline Parallel to and Crossing Spencer Creek and crossing Clover Creek, near Milepost 177



Evaluation and Findings Report: Section 401 Water Quality Certification for the Jordan Cove Energy Project. Oregon Department of Environmental Quality. May 2019. P. 39.

The DEIS fails to adequately address the effectiveness of proposed BMPs in the permanent ROW to minimize sediment pollution using quantitative modeling and site-specific analysis. Further, the DEIS fails to comprehensively analyze the proposed treatment of discharge from slope breakers immediately upslope from streams.

The DEIS should require a comprehensive environmental review for each stream crossing, particularly for those crossings identified as moderate or high risk. Further, the DEIS should require a topographic survey, longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes for each stream crossing.

Additionally, the DEIS should fully evaluate the direct, indirect, and cumulative effects of the pipeline overlying an unconsolidated-deposit aquifer in the Klamath Basin over 23 miles between MPs 191.9 and 214.9. According to the DEIS:

CO28-180 cont.

CO28-181

CO28-182

CO28-181 See response to comment CO28-164 (which would apply also to right-of-way clearing).

CO28-182 Effects on groundwater are evaluated in section 4.3.1.2, including pipeline installation in areas with shallow groundwater at or near the surface.

These aquifers consist primarily of sand and gravel and are the most productive and widespread aquifers in Oregon. These unconsolidated-deposit aquifers typically provide freshwater for most public-supply, domestic, commercial, and industrial purposes (USGS 1994).[356]

CO28-182 cont.

2. Klamath River HDD Crossing

The applicant proposes to use Horizontal Directional Drilling (HDD) technology to cross the Klamath River at MP 199.38. The HDD crossing is given a Level 1 moderate risk of channel migration, scour, and/or avulsion. The use of HDD also poses the risk of an unintended release of drilling fluid known as a frac-out. The DEIS fails to comprehensively disclose and analyze the likelihood and frequency of frac-out events. The State re-iterated these concerns in its 2017 scoping comments.[357]

CO28-183

The September 2017 GeoEngineers report regarding the Klamath River HDD states:

> As is typical of HDD installations, we anticipate that there is a relatively high risk of hydraulic fracture and drilling fluid surface release within about 100 feet of the entry and exit points.[358]

This assessment emphasizes both the uncertainty and likelihood of a frac-out event using HDD technology to drill under the Klamath River. The Klamath is already water quality impaired for dissolved oxygen, toxics, sedimentation, habitat modification, and temperature. Further, the Klamath River provides habitat for threatened and endangered fish. A frac-out as a result of HDD would impair water quality and designated beneficial uses, in violation of state water quality standards and the Clean Water Act.

Additionally, the applicant does not provide adequate information regarding impacts to groundwater as a result of HDD and the DEIS fails to comprehensively evaluate these impacts. The September 2017 GeoEngineers report states:

> We did not measure groundwater levels upon completion of the borings because of the presence of drilling fluid in the holes at the time of drilling. We anticipate that groundwater levels will mimic the elevation of the Klamath River around 4,092 feet MSL. We anticipate that groundwater levels will fluctuate with precipitation, site utilization and other factors.[359]

CO28-184

Merely "anticipating" impacts to groundwater is not a comprehensive and site-specific review of the potential consequences of a frac-out related to HDD crossing of the Klamath River.

[356] 2019 DEIS at 4-78.
[357] Stat of Oregon 2017 Scoping comments at 15.
[358] Klamath River HDD Pacific Connector Gas Pipeline Project Klamath County, Oregon. 1 September 2017. P. ES-1. PCP Part 2 Appendix B 8 May 2018. P. 1662.
[359] Klamath River HDD Pacific Connector Gas Pipeline Project Klamath County, Oregon. 1 September 2017. P. ES-6. PCP Part 2 Appendix B 8 May 2018. P. 1671.

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CO28-183 See response to comment CO28-173 addressing HDD crossings and CO28-166 address risk of stream crossings above.

CO28-184 The cited report (GeoEngineers' 2017 Horizontal Directional Drilling Design report) addresses HDD feasibility at the site and presents assumptions about groundwater levels used in their analysis. Notably, the report found that the proposed crossing of the Klamath River can be installed successfully and there is a low risk of drilling fluid surface release along the portion of the HDD path located beneath the Klamath River.

The DEIS should fully evaluate the potential for a frac-out and BMPs to address water quality pollution, including but not limited to temperature, sediment, and dissolved oxygen from the applicants.

CO28-184 cont.

3. Removal of Riparian Vegetation

The proposed action would cause stream temperature increases by removing riparian vegetation across a wide construction easement. Removing riparian vegetation will increase water temperature by decreasing shade in numerous streams identified as having salmon and steelhead spawning use, having core cold water habitat use, having salmon and trout rearing and migration use, or having migration corridor use. The DEIS should require specific information about baseline temperatures in streams where riparian vegetation would be removed.

The Upper Klamath watershed supports habitat for the following threatened and endangered species listed under the ESA that are sensitive to temperature: shortnose sucker, Lost River sucker, Bull trout, and Redband/Rainbow trout. The Klamath River, Spencer Creek, and Clover Creek are all listed as water quality impaired for temperature. Any temperature increases in these streams as a result of the proposed activities would exacerbate existing violations of state water quality standards. The Ninth Circuit Court of Appeals recently made clear that new dischargers may not add a pollutant into a water body that is water quality limited.[360]

CO28-185

Additionally, removing riparian vegetation also decreases Large Woody Debris that is an important component of stream morphology and habitat for aquatic species.

The DEIS should comprehensively evaluate the direct, indirect, and cumulative effects of removing riparian vegetation for pipeline construction and operation, particularly for waterways that are already impaired for pollutants such as temperature, sediment, and dissolved oxygen. The DEIS should also require information about baseline temperatures in streams that would suffer removal of riparian vegetation and stream shading.

4. Road Construction

The applicant proposes construction of temporary access roads (TARs) at 10 locations impacting 3.8 acres and construction of 15 permanent access roads (PARs) impacting 2.16 acres.[361] The DEIS fails to provide site-specific analysis of road construction, operation, and maintenance. Not only is road construction inadequately described, but the measures to prevent significant sedimentation and turbidity in streams are neither site-specific nor reliable.

CO28-186

DEQ in its denial of the 401 certification for the project specifically identifies the failure of the applicant to provide site-specific information about operations and maintenance of TARs and PARs in its rationale for the denial. The DEIS should require the applicant to specify the actions it will take to maintain these roads and identify what road maintenance standards they will

[360] See Friends of Pinto Creek v. United States Environmental Protection Agency, No. 05-70785, (9th Cir. Oct. 4, 2007).
[361] Pacific Connector Pipeline Resource Report 1 General Project Description, p. 31, PCP Part 2 Appendix B 8 May 2018. p. 329.

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CO28-185 See response to comment SA2-86. Temperature changes were modeled at numerous crossing from small to large and results reported in sections 4.3.2 and 4.3.4. Temperature modeling, assuming no vegetation shading, found very small changes, most of which would be functionally not measurable, especially larger fish-bearing streams. Most streams are small, and even low bush and grass would supply substantial shade. Small streams are the ones showing the largest potential temperature change, while modeling studies show rapid recovery of temperature below the open crossing. Additionally, LWD reduction, addressed in section 4.5.2, would not be substantial.

CO28-186 See response to comment CO28-164.

follow. The DEIS fails to disclose how the TARs and PARs will be kept free from mud and other road debris resulting from construction activities.

Further, the DEIS should require information and analysis regarding how the applicant will manage all BOR access roads, including but not limited to: inventory method the applicant will use to evaluate the current condition of existing roads and current capacity to protect water quality; need for maintenance treatments prior to use by the applicant; design standards and specifications for construction that the applicant will use to ensure that access roads are improved as needed to protect water quality; information on the selection criteria the applicant used to site the proposed PARs and TARs; and engineering designs the applicant will use to construct stormwater treatment controls for post-construction stormwater discharge to water conveyance structures connected to waters of the state. CO28-186 cont.

The DEIS should also require information regarding the specific location with GPS coordinates for all road maintenance treatments the applicant proposes to implement to protect water quality on all access roads that are currently hydrologically connected to waterbodies. The DEIS should require specific design details and technical support for each TAR and PAR to determine whether new permanent and temporary roads will be hydrologically disconnected to waterbodies and in compliance with state and federal laws. The DEIS should require the applicant to provide selection criteria it will use to propose new roads that avoid impacts to waterways.

5. Hydrostatic Testing

The applicant provides minimal information regarding the source and discharge of hydrostatic testing water. As stated in Resource Report 1:

Water for hydrostatic testing will be obtained from commercial or municipal sources or from surface water right owners (see Table 1.3-2). If water for hydrostatic testing is acquired from surface water sources, PCGP will obtain all necessary appropriations and withdrawal permits (see Appendix C.1). As required by ODFW, pumps used to withdraw surface water will be screened according to National Marine Fisheries Service screening criteria to prevent entrainment of aquatic species.[362]

For the Klamath watershed, the applicant proposes hydrostatic testing water withdrawals from "Klamath River, or Lake of the Woods, or Keno Reservoir, or John C. Boyle Reservoir."[363] According to Table 1.3-2 Potential Hydrostatic Source Locations, the applicants could withdraw 5.6 million gallons from Lake of the Woods, 5.6 million gallons from John C. Boyle Reservoir, 5.6 million gallons from the Klamath River, and 4.6 million gallons from the High Line Canal. The DEIS identifies the Klamath River and the Lost River as potential sources, including the Lost River Anthony Blair Deep Well, Gavin Rajnus Deep Well, and Ryan Hartman Deep Well as additional potential sources.[364] CO28-187

[362] Pacific Connector Pipeline Resource Report 1 General Project Description. 8 May 2018. P. 53. PCP Part 2 appendix B from DEQ 8 May 2018 p. 351.
[363] Pacific Connector Pipeline Resource Report 1 General Project Description. 8 May 2018. P. 58. PCP Part 2 Appendix B from DEQ 8 May 2018. P. 352.
[364] 2019 DEIS at 4-110.

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CO28-187 As discussed in section 4.3, "Pacific Connector would obtain all necessary appropriations and withdrawal permits, including from the ODWR, prior to use." Additional text was added to clarify the review process. The final determination of whether the application meet availability, water rights and beneficial uses would be determined by the State during the State application for withdrawal made by the Applicant. The Applicant would obtain all necessary appropriations and withdrawal permits, including from the ODWR, prior to use. As part of this process, ODWR would have the applications reviewed by ODEQ and ODFW to determine if there are concerns about the impact water withdrawals may have on water resources (including concerns relating to the timing, seasonality, and method of withdrawal), as well as water quality and/or fish and wildlife species and the habitat, respectively. ODWR would provide public notice and opportunity to comment on the applications.

The DEIS fails to fully evaluate the availability of this surface water for the proposed hydrostatic testing, even with cascading water from one test site to the next. As the applicant admits: CO28-187 cont.

> If determined to be feasible for hydrostatic testing requirements, water would be returned to its withdrawal source location after use; however, cascading water from one test section to another to minimize water withdrawal requirements may make it impractical to release water within the same watershed where the water was withdrawn. If it is impracticable to return hydrostatic test source water to the same water basin from which it was withdrawn, PCGP would employ an effective and practical water treatment method (chlorination, filtration, or other appropriate method) to disinfect the water that would be transferred across water basin boundaries. The hydrostatic test water would be treated after it is withdrawn and prior to hydrostatic testing.[365] CO28-188

The DEIS fails to comprehensively analyze the feasibility of withdrawing and discharging water for hydrostatic testing within the same watershed. Further, the DEIS fails to comprehensively disclose the direct, indirect, and cumulative effects of discharging chlorinated water on fish and other aquatic life.

Not only would these water withdrawal impact existing water rights, but reducing flows can also impair water quality, in violation of water quality standards. In the U.S. Supreme Court decision in *Jefferson City Public Utility District v. Ecology Dept. of Washington* in 1994, Justice O'Connor wrote:

> In many cases, water quantity is closely related to water quality; a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation or, as here, as a fishery. In any event, there is recognition in the Clean Water Act itself that reduced stream flow, *i.e.*, diminishment of water quantity, can constitute water pollution. First, the Act's definition of pollution as "the man made or man induced alteration of the chemical, physical, biological, and radiological integrity of water" encompasses the effects of reduced water quantity. 33 U.S.C. § 1362(19). This broad conception of pollution--one which expressly evinces Congress' concern with the physical and biological integrity of water--refutes petitioners' assertion that the Act draws a sharp distinction between the regulation of water "quantity" and water "quality." Moreover, §304 of the Act expressly recognizes that water "pollution" may result from "changes in the movement, flow, or circulation of any navigable waters . . . including changes caused by the construction of dams." 33 U.S.C. § 1314(f).[366]

The DEIS should carefully review the direct, indirect, and cumulative impacts of water withdrawals from the Klamath and Lost River Basins on water quality and ESA-listed species. CO28-189

[365] Pacific Connector Pipeline Resource Report 1 General Project Description. 8 May 2018. P. 52. PCP Part 2 Appendix B from DEQ 8 May 2018. P. 350.
[366] PUD No. 1 of Jefferson Cty v. Washington Dept. of Ecology. 511 U.S. 700 (1994). https://www.law.cornell.edu/supct/html/92-1911.ZO.html.

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CO28-188 See response to comment CO28-187.

CO28-189 Listed species effects are addressed in section 4.6 and in the BA. Also, see response to comment CO28-187.

M. Road Construction.

Although not delineated on Pacific Connector's Environmental Alignment Sheets (Resource Report 1, Appendix H.1) or discussed in their Erosion Control and Revegetation Plan, typical drawings for right-of-way cross-sections in Resource Report 1 clearly show the use of a construction access road in the right-of-way. Without a durable surface, the soil in this corridor would experience compaction during the construction of the right-of-way, and during the trenching for pipe installation. The resulting soil compaction would increase runoff and, subsequently, erosion of native soils via rill and gully erosion without additional BMPs for the construction access road surface Pacific Connector has not provided BMPs for the 229-mile construction access roadway in the form design standards, specifications, and measures necessary to support the anticipated traffic load.

During a severe rain event such as an atmospheric river, a durable unpaved road surface is essential to prevent fine soil particles from migrating to the road surface under truck traffic. Once on the road surface, stormwater entrains this soil during wet weather transporting it to swales (e.g., zero order streams), first order streams (e.g., bedrock hollows), and to streams. With the proposed pipeline alignment traversing 117 miles of steep slopes and 94 miles of severe erosion potential soils, careful selection of BMPs and the application of treatment methods are essential for water quality protection. Pacific Connector has failed to identify construction access road design standards, specifications and design drawings that adequately control discharge points to direct stormwater discharge to structural stormwater treatment controls or vegetated areas with permeable soils. Pacific Connector has failed to spatially explicit identify the location of discharge points for concentrated stormwater flow from swales and channels collecting this runoff to avoid initiating catastrophic landslides on the extensive area of unstable slopes along the pipeline ROW. Water quality impacts to streams would likely result from discharges of stormwater to landslide prone slopes, as well as from the placement of fill or spoils on such slopes. Pacific Connector has not provided specific designs for the construction access road stormwater management system adjacent to steep slopes (>30%) and landslide susceptibility zones. Section 4.1 of the proposed ECRP, Pacific Connector proposes a list of temporary erosion control BMPs for the construction ROW that are evaluated below.

The DEIS fails to acknowledge severe sedimentation of streams caused by the construction of a much smaller gas pipeline from Roseburg to Coos Bay. (See Register Guard Article dated 7/25/2004 "Enterprise goes Sour"). The DEIS fails to discuss scientific uncertainty and scientific controversy regarding the effectiveness of sediment control measures identified in the DEIS (see DEQ 2019). Since sediment control measures failed catastrophically during the construction of a previous gas pipeline, similar sediment discharges are possible for this gas pipeline because this pipeline traverses the same unstable steep terrain in Tyee sandstone geology. This 36 inch pipe is much larger, and the area of deforestation is much larger than smaller 12" pipeline constructed in 2004. The DEIS fails to address the credibility issue surrounding gas pipeline construction in southwest Oregon and associated severe sediment impacts to many miles of coho salmon streams. from previous gas line construction. Assertions of "not noticeable", "minor" or "negligible" sediment impacts for this pipeline are not scientifically or empirically substantiated (DEIS 4-68). CO28-190

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CO28-190 The potential impacts of sediment are addressed in sections 4.3 and 4.5.2. The Applicant has developed plans, including the ECRP, that would be implemented to control potential runoff and erosion to streams. Construction BMPs for roads in areas of potential road erosion and other sediment sources including riparian and upland erosion from right of way clearing would generally be employed as discussed in section 4.2.2.2. These plans include requirements that all permit requirements be followed which would include those designed by the State to maintained water quality through the 401 certificate requirements. We acknowledge that complete elimination of input of sediment from Project actions would not occur. Ultimately, permits addressing water quality protections would need to be obtained from the State before any construction can occur. The 401 water quality certification is a State requirement and is beyond the scope of the EIS. It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations or OARs. We assume that the State would determine if the Project is in compliance with the State requirements during their review of Applicant's State permit applications. The State can include the requested information and mitigation as part of their permit requirements. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all federal and applicable federally delegated permits.

N. Construction right-of-way BMPs are inadequate to prevent excessive sediment from reaching streams.

Pacific Connector would use temporary slope breakers (i.e., water bars) to prevent rill and gulley erosion when construction stormwater discharges from the ROW, the 229-mile construction access road, and the non-working side of the ROW. If properly spaced, slope breakers may effectively serve as a runoff control, preventing rill and gully erosion in the construction ROW and construction access road. We assert that these temporary slope breakers would not function as predicted under anticipated traffic loads. Without additional design considerations, this traffic would compact the berm of the slope breaker and modify the excavated channel form, potentially modifying its flow path (see Resource Report 1, Drawing Number 3430.34-X-0008). Stormwater moving out of slope breaker and back onto the ROW would form rill and gully erosion and potentially affect the proper function of downstream temporary slope breakers.

Stormwater with suspended sediment from the construction ROW and construction access road would collect in the excavated channel in front of each slope breaker and would flow towards a discharge point. Pacific Connector has not identified specific BMPs, for example, to prevent (1) rill and gully erosion from concentrated flow at discharge points and (2) sediment discharge from exposed soil to zero order streams. Zero order streams refer to swales such as bedrock hollows and are an integral part of stream networks serving as conduits to first order streams. Pacific Connector has not identified the distance between the discharge point of slope breakers and other erosion control BMPs in relation to zero order streams. Pacific Connector has not demonstrated that how it would avoid stormwater discharge to areas of landslide susceptibility connected to zero order streams.

Pacific Connector's proposed construction ROW would place grading spoils and, if needed, fill to level working surface. Construction of the pipeline appears likely to discharge stormwater to these landslide susceptibility zones commonly referred to convergent headwalls, as exhibited in DEQ 2019 Fig. 4a and 4b. Research and technical manuals identified in DEQ 2019 indicate that adding water and weight to unstable slopes would increases the risk of catastrophic slope failure but the DEIS fails to fully analyze this risk or provide site specific and effective mitigations. CO28-191

In Section 4.1.4 of the ECRP, Pacific Connector proposes to use mulch (i.e., effective ground cover). The application of mulch to exposed soil is an effective BMP presuming stormwater run-on controls are in place to prevent stormwater from mobilizing the mulch in runoff. Pacific Connector states that it would use this BMP when permanent stormwater controls such as reseeding and permanent slope breakers installed on the operational ROW are delayed beyond 20 days. During wet weather and especially during anticipated atmospheric rivers, the exposed soil is subject to splash erosion initiating runoff and the potential for rill and gully erosion carrying sediment to streams. The criteria of a 20-day delay in installing permanent controls establishes a window of water quality at risk not analyzed in the DEIS. During wet weather, and especially during extreme rainfall during atmospheric rivers excessive sediment is likely to reach streams and contrary to assertions in the DEIS. Moreover, on its Environmental Alignment Sheets, Pacific Connector has not delineated the travel ways into and within TEWAs or selected a durable surface for these travel way as a source control for these exposed soil surfaces. Durable surfacing for construction travel ways is a typical BMP that was not addressed in Pacific CO28-192

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CO28-191 Landslides along the pipeline route are discussed and evaluated in section 4.1.2.4 of the EIS including BMPs and specific mitigation for high-risk landslide areas.

CO28-192 See response to comment CO28-190.

Connector's erosion control planning. The DEIS fails to identify durable surfacing as a BMP for the ROW as described by DEQ 2019. CO28-192 cont.

Pacific Connector proposes to use a silt fence parallel to the ROW to control sediment discharge from the 229-mile construction access road and construction right-of-way. The construction ROW with its construction access road on ridgetops above steeps slopes has numerous adjacent areas with zero order streams that would serve as a channel carrying sediment from the ROW to first order streams. For areas of concentrated flow such as a swale, a silt fence is not designed to treat concentrated flow nor treat silt or clays deeper than sheet or overland flow. Additionally, according to the EPA, a silt fence has limits on the drainage area it can treat. In its submittal, Pacific Connector provides no evaluation for the drainage area for silt fences, and does not identify alternative means of managing flow where a silt fence is inadequate. Sediment discharge overland within 200 feet of a waterbody *or a swale connected to a waterbody* has the potential to discharge sediment to this water body. Pacific Connector and the DEIS appears to have limited the analysis to roadways and other land disturbances within 200 feet of a perennial or intermittent stream. Analysis in the DEIS is missing for the ROW as it affects highly sensitive swales/zero order basins adjacent the ROW. The DEIS fails to admit that silt fences are unlikely to prevent potential initiation of catastrophic debris flows (landslides) from swales/zero order basins adjacent the ROW. CO28-193

Pacific Connector proposes to use biobags, straw wattles, and slash filter windrows to control sediment discharge from the construction ROW. The DEIS fails to report that check dams constructed of biobags and straw wattles are only moderately effective in trapping sediment and preventing channel erosion even if properly spaced (ODEQ 2019:24). Moreover, when used in a drainage swale, they provide only a secondary design benefit. The DEIS fails to report that their application requires primary controls such as durable construction access road surfacing and stormwater management to avoid concentrated flows, thus these sediment controls are inadequate to support claims of sediment minimization in the DEIS. Additionally, Pacific Connector would use slash filter windrows as a perimeter control for the construction right-of-way as indicated on Environmental Alignment Sheets. Slash filter windrows are typically placed on a contour at the toe of constructed road fill slopes to intercept sediment. Research cited in ODEQ: 2019 shows these windrows can reduce sediment leaving a fill slope by 75 to 85 percent which means 15-25% of sediment would be free to travel downslope and pollute into waterways. The DEIS fails to report that slash filter windrows are not effective and not designed for treating concentrated flows in rills, swales, and drainage channels arising from construction areas. Sediment would not be minimized as asserted. Pacific Connector has not provided information showing that forest slash when placed on soil surfaces dissected with rills, swales, and natural drainage channels would provide a continuous "seal" along the soil surface. Such a seal at the surface assures that a control measure for sheet runoff would trap suspended sediment. This seal at the soil surface may be achieved with a properly installed straw wattle countersunk into the soil. However, the rigid structure of forest slash would leave depressions from rills, swales, and channels below the windrow providing a path of least resistance for runoff and the sediment it carries. In the highly erosive Tyee Core Area, Pacific Connector proposes to place slash filter windrows below fill and spoils storage on headwalls. For example, in Drawing Number 3430.29-006 (Sheet 6 of 226) in the Environmental Alignment Sheets, Pacific Connector proposes to use windrows on the border of the construction ROW where fill and/or grading spoils would be CO28-194

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CO28-193 Silt fences and other erosion control devices are designed to reduce erosion and sediment input, but the EIS does not state that all erosion and sedimentation would be eliminated by these measures.

CO28-194 The BMPs described in the EIS are designed to reduce erosion and sediment input, but the EIS does not state that all erosion and sedimentation would be eliminated by these measures. The typical BMP drawings are included by reference and are provided in Resource Report 1 of the application to the FERC.

placed. Pacific Connector would locate these windrows in a zero order stream below steep headwalls located along Pipeline Mileposts 8.56 to 8.75 (see Figure 5 in ODEQ 2019: 24). These windrows and their construction stormwater discharged are directly connected to zero order streams (i.e., bedrock hollows) and, ultimately, first order streams. The DEIS fails to admit that slash filters would not prevent substantial amounts of concentrated sediment laden water from entering swales/zero order basins that are conduits for first-order streams. The DEIS fails to adequately disclose the extent of increased risk for severe gully erosion and/or debris flows from the ROW despite identified BMPs. CO28-194 cont.

Pacific Connector proposes to use temporary slope breakers to concentrate and channel stormwater away from the construction ROW and construction access road. Research cited in ODEQ 2019 shows that rills and gullies resulting from concentrated road surface discharge reduces the effectiveness of mulch treatments on fill slopes and carries sediment long distances below these slopes. Uniform drainage from the road surface would minimize erosion on the fill slopes. However in areas of steep slopes, Pacific Connector is proposing to use temporary slope breakers (i.e., water bars) that would concentrate stormwater discharge onto fill slopes above slash filter windrows. These slash filter windrows are intended to manage sheet flow on fill slopes rather than concentrated flow from a temporary slope breaker. The DEIS fails to acknowledge that the combination of slope breakers and windrows are not appropriate on steep, unstable slopes that are common in the coast range. The DEIS fails to provide BMPs that would address storm runoff from the ROW on steep slopes. The DEIS has failed to use modeling (see DEQ 2019) to evaluate the efficacy of its proposed construction ROW BMPs to ensure Pacific Connector is providing the highest and best treatment controls. We and DEQ assert this modeling is essential to determining consistency with Oregon's statewide narrative water quality standard given the prevalence of steep slopes and zero order streams in close proximity to the construction ROW. In summary, the DEIS fails to adequately describe the BMPs used for variable steepness of the ROW and geomorphic features such as swales, headwalls and zero order basins.

O. The DEIS proposed action fails to adequately consider water quality impacts from ROW construction along unstable slopes.

Pacific Connector/DEIS fails to provide site specific engineering drawings for its stormwater management system for the construction ROW and the 229-mile construction access road in areas of steep slopes and landslide susceptibility zones. Pacific Connector is proposing to place grading spoils and, potentially, fill to level working surfaces, on geologically unstable slopes to support the 95-foot construction ROW including the Temporary Extra Work Areas (TEWAs). The DEIS fails to discuss the increased risk of erosion/landsliding affecting water quality from this proposed action. Pacific Connector Geologic Hazard Maps show geologically unstable slopes such as mapped landslides and rapidly moving landslide hazard areas in close proximity to the construction ROW (Appendix F, Geologic Hazards Maps for Pacific Connector Gas Pipeline. Part 2: Appendix C, Resource Report 6). The Oregon Department of Geology and Mineral Industries (DOGAMI) has documented landslide hazards in Oregon and developed peer-reviewed procedures for identifying site-specific landslide hazards. For example, the Tyee Core Area in Oregon's Coastal Range is an area of high landslide activity including both shallow and deep-seated landslides. The proposed pipeline traverses the Tyee Core Area from approximately CO28-195

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CO28-195 The ODEQ 2019 reference or document was not provided as a part of this comment. Landslides along the pipeline route are discussed and evaluated in section 4.1.2.4 of the EIS including BMPs and specific mitigation for high-risk landslide areas. Also see response to comment SA2-43.

Milepost 6 to 55. Research and technical references on slope stability are clear that land managers should avoid adding water or weight to unstable slopes and avoid cutting into unstable slopes without appropriate geotechnical engineering. (See technical citations in ODEQ 2019:25). Oregon has seen other linear infrastructure development (i.e., roads, pipelines) initiate landslides, particularly in the Oregon coast range (State Highway 20, and Coos County Natural Gas Pipeline).Depending on the landslide type and proximity to streams, landslides can deposit substantial amounts of organic and inorganic debris into streams impacting the aquatic life dependent on these streams. Although landslides are a natural geomorphic process for streams in the Coast and Cascade Ranges, human-caused debris torrents affect water quality by changing the natural cycles of sediment delivery to stream systems. The DEIS fails to adequately analyze increased risk of landsliding from the ROW and subsequent impacts to water quality and aquatic life.

CO28-195 cont.

The DEIS fails to specifically acknowledge and adopt technical guidance under the Oregon Forest Practice Act intended to ensure forest operations such as road use and road building do not initiate landslides. Oregon Department of Forestry uses the Forest Practices Act rules to comply with Oregon water quality standards. OAR 629-625-0200 provides that "operators shall avoid locating roads on steep slopes, slide areas, high landslide hazard locations, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist." The DEIS is defective because it has not demonstrated that viable alternatives do not exist and failed to take a hard look at viable alternatives in the DEIS. The DEIS fails to formerly adopt OFA requirements: OAR 629-625-0310(2)-(4) provides that "(2) operators shall end-haul excess material from steep slopes or high landslide hazard locations where needed to prevent landslides[;] (3) Operators shall design roads no wider than necessary to accommodate the anticipated use[;] (4) Operators shall design cut and fill slopes to minimize the risk of landslides[;] (5) Operators shall stabilize road fills as needed to prevent fill failure and subsequent damage to waters of the state using compaction, buttressing, subsurface drainage, rock facing or other effective means. Similarly, OAR 629-625-0330 includes other direction on management of drainage from forest land roads. We assert that these regulations apply to the ROW because it will be used as "forest road" during construction. We also assert the DEIS is defective because it principally analyzed landslide potential as it would affect the pipeline integrity to function safely but failed to adequately assess landslide potential as it would affect water quality and aquatic life (e.g. coho salmon).

CO28-196

P. The DEIS proposed action fails to adequately identify shallow landslide susceptibility along the ROW and prescribe appropriate mitigation

In Section 4.5.1 of Resource Report 6 (Geologic Resources), Pacific Connector presents their three-phase methodology for a landslide hazard evaluation. Phase I involved an office review of geologic maps and publications, county and state hazard maps, Natural Resource Conservation Services soil surveys, topographic maps, LiDAR hillshade models, and stereo aerial photographs. Phase II involved an aerial reconnaissance, and Phase III involved a surface reconnaissance. In Section 4.5.2, Pacific Connector clarifies its statements of risk in the landslide hazards evaluation report for Resource Report 6. The DEIS is defective because hazard evaluation principally evaluated the potential for damage or failure of the pipeline from earth

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CO28-196 It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations. We assume that the State would determine if the Project is in compliance with the State requirements during their review of the Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all applicable federal and federally delegated permits.

movements. Pacific Connector landslide hazard evaluation did not consider the risk of pipeline construction and operation initiating a landslide impacting water quality and aquatic life. CO28-195 cont.

In Section 4.5.3.1 of Resource Report 6, Pacific Connector recognizes that rapidly moving landslides typically occur on steep slopes within zero order stream basins. In this section, Pacific Connector notes that these landscape features can fail and generate a debris torrent that travels great distances along defined stream channels. DEQ 2019:22 figure 4 provides examples of this type of unstable landscape feature. DEQ 2019:24 Figure 5 shows a segment of the pipeline that clearly shows the working side of the construction ROW with its construction access road and Temporary Extra Work Area above three headwalls (i.e., unstable slopes). These areas would support trenching and grading spoils and may require fill to level this working surface. The weight of the fill and/or trench and grading spoils, the anticipated traffic loads, and the stored material in combination with additional runoff due to the lack of a forest canopy present a substantial water quality risk to streams as well as a risk to worker and public safety. The DEIS fails to acknowledge these risks or provide mitigations at this specific location and numerous others. DEQ performed a preliminary review of the LiDAR maps in a sample section of the Tyee Core Area and found many areas of concern. Two of these areas are illustrated in DEQ 2019:27 Figures 6 and 7. The DEIS is defective because it does not provide site-specific geo-engineering measures for fills and cuts on unstable slopes . DEQ (2019) determined that Pacific Connector did not include the area from between Milepost 8.56 to 8.75 in its field data collection and risk assessment. Pacific Connector also did not conduct a surface reconnaissance for the areas of concern featured in Figures 6 and 7. On Page 31 in Section 4.5.3.2 of Resource Report 5 (Geologic Resources), Pacific Connector indicates it used LiDAR, 10-meter DEM, and aerial photography to identify moderate and high RML sites. This section provides the risk criteria Pacific Connector used to identify the RML sites selected for surface reconnaissance and included in Table B-3a. Pacific Connector's selection criteria was to identify the potential for a RML to induce strain on the pipeline and for RML erosion to expose a pipeline. These two selection criteria would not ensure the identification of RML sites posing a risk to streams and water quality. The DEIS is defective because it did not adequately consider the landslide hazard risks to streams initiated by the construction and operational ROW. CO28-197 CO28-198

The DEIS is also defective because it did not use Special Paper 42 (inventory methods) and SP-45 for site specific landslide evaluation as described by DEQ 2019:28 and recommended by DOGMI. The results from an inventory using the SP-42 protocol support the identification of shallow-landslide and deep-seated landslide susceptibility zones to complete a scientifically credible landslide hazard assessment (best available information). Existing data in the DEIS is not accurate and increases risk of failing to take appropriate protective measures as described in DEQ 2019. Using the SP-42 inventory, DOGAMI recommends following the procedure in Special Paper 45 (SP-45) to identify shallow landslide susceptibility maps and SP-48 for identifying deep-seated landslide susceptibility zones. Using the site specific landslide inventory from SP-42, the procedure in SP-48 can assist in identifying and mitigating existing deep-seated landslides and slopes. The use of SP-42 in conjunction with SP-45 and SP-48 ensures identification of all the sites within and along the pipeline ROW where geo-engineering controls are needed to prevent spoil storage, cuts, and fills from pipeline construction and stormwater discharge from initiating unwanted landslides depositing organic and inorganic debris into CO28-199

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CO28-197 Section 4.2.2 of the EIS describes BMPs and other mitigation measures that would be employed for construction of the pipeline in areas of landslides and potentially unstable slopes. It is noted that necessary State permits would be acquired prior to construction of the Project. It is also noted that LiDAR data were reviewed to identify potential landslide areas (see response to Comment SA2-43). The reference to ODEQ 2019 is not clearly defined or provided.

CO28-198 The EIS acknowledges risks to streams and water bodies from landslides. It is acknowledged that catastrophic events can occur and that sometimes there is not a way to fully predict such events. EIS section 4.1.2.4 includes identification of active and high-risk landslides along the pipeline route; as well as BMPs and mitigation measures for specific areas of concern that would be implemented. Also see response to comment SA2-43.

CO28-199 See response to comment SA2-43.

streams. Current inventory methods used by Pacific Connector have been shown to be inadequate by DEQ to protect water quality.

CO28-199 cont.

Q. The proposed action fails to identify BMPs adequate to mitigate landslides that will pollute streams with sediment.

Pacific Connector's proposed activities create a significant risk of sediment transport to both perennial and intermittent streams. Pacific Connector JCEP identifies three ways that pipeline construction methods would reduce slope stability and create a risk of sediment transport:1) deep excavation perpendicular to the slope (i.e., creating a cut across a slope); 2) capturing and concentrating stormwater along the ROW and discharging this stormwater to potentially unstable slopes; and 3) placing fill on a headwalls (see Section 4.6.1 of Resource Report 6-(Geologic Resources), In Section 4.6.2 of Resource Report 6, Pacific Connector states that it would engineer fill slopes constructed at gradients of 30 percent or greater to ensure long-term slope stability and it would identify side-slope ROW construction segments on steep slopes during the final design phase for this project. The DEIS fails to include "final design phase" which means there are no site specific BMPs identified for high risk sites. Pacific Connector references its Erosion Control and Revegetation Plan for BMPs to manage surface water and groundwater near unstable slopes but it is generic with no site specificity. Pacific Connector identifies the use of temporary and permanent slope breakers (i.e., water bars) which concentrate stormwater in an excavated channel in front of a berm. Runoff would substantially increase after removal of the forest and shrub canopy and herbaceous vegetation. During construction and for several years post construction, the drainage area for each temporary slope breaker is the 95-foot wide construction ROW and the 100 feet of ROW to the next temporary slope breaker based on FERC's spacing requirements. The DEIS proposed action is a threat to water quality because it does not identify the locations of the discharge points for the concentrated flow in relation to unstable geologic features. Contrary to what is stated in the DEIS, the temporary slope breakers could increase the likelihood for discharge that would reduce slope stability. The generic BMPs identified in the DEIS are not likely to succeed in keeping waste materials out of public waters and minimizing erosion of cut banks, fills, and road surfaces. The risk of failure is especially high in the coast range Tyee geology. Pacific Connector cannot assure water quality with generic BMPs applied at set intervals with inadequate consideration of geologic and geomorphic context for each pipeline segment.

CO28-200

R. The DEIS proposed action fails to provide site specific controls to prevent excessive sedimentation, turbidity and stream damage from dry open-cut waterbody crossings.

The proposed action fails to provide site specific mitigation measure for each stream crossing, i.e. "context" as per NEPA. It appears that the principal consideration for steam crossings in Table I-2 was if the pipe could be installed: "Dry open-cut methods feasible/practical on small non- fish intermittent tributary if flowing at the time of construction". Table I-2 has no column for mitigations based on site conditions i.e. context. For example, there is no site specific consideration of hill slope stability, stream slope, valley width or stream channel incision. DEQ 2019 reports that on steep unstable slopes, a dewater structure can saturate the area round the structure creating a positive soil pore pressure. A positive soil pressure can destabilize a slope

CO28-201

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CO28-200 See response to comment CO28-190.

CO28-201 See response to comment CO28-166.

causing a small slope failure that discharges a debris flow into a stream. In addition, on steep slopes, spoils from trenching can discharge sediment to the stream if there is no spatially explicit planning to properly site these spoils and prevent the decant water with suspended sediment from discharging into the stream. The DEIS relies on a single set of generic drawings to be applied to hundreds of highly variable stream valleys. The DEIS provides no technical method to assure that the bankfull width and depth is restored to pre-disturbance elevations. The DEIS fails to acknowledge the potential for aggradation in front of the crossing and/or stream incision below the crossing. High gradient streams in constricted valley may have greatly increased impacts with the standard dry open-cut method. The DEIS erroneously claims that nearly all streams can be crossed with dry open-cut as depicted and fails to provide and analyze alternative methods at locations that may be more environmentally damaging (wet open- cut) or less damaging (HDD).

CO28-201 cont.

S. The DEIS proposed action fails to provide site-specific controls to prevent excessive sedimentation and turbidity from dry open-cut dewatering discharge.

Pacific Connector describes general procedures for dewatering work areas during dry open-cut waterbody crossings. These methods rely on upland containment areas to promote sediment settling and infiltration of the turbid discharge. Pacific Connector expects to site these structures in areas that can infiltrate the overflow from the dewatering structure into the surrounding area. Discharging water to upland areas can locally saturate shallow soils causing slope failure and mass movement. DEQ (2019) identified several crossing locations where existing terrain and soil conditions may cause slope instability. For example, the pipeline alignment crosses Steinnon Creek at two locations, at MP 20.02BR, and 24.32BR. Steinnon Creek is a Level 0 stream and is upstream of spawning and rearing habitat for Endangered Species Act (ESA) listed Coho salmon. In Table B.3-4, Pacific Connector notes steep topographic conditions for this reach near Milepost 20.20BR. Roering et al. (2005) and Pacific Connector's Geologic Hazard Map (see Figure 5 of 47) identify contrasting steep and dissected terrain and a bench-like, low gradient form adjacent to this reach suggesting remnants of a deep seated landslide and therefore an unstable slope. Steinnon Creek is crossed again at MP 24.32BR using a dry open cut procedure. The slopes adjacent to this crossing are landslides 126 and 127 identified from the Department of Geology and Mineral Industries Open File Report. The DEIS proposed action is inadequate to protect water quality because it fails to identify a stable location for each dewater structure and the number of these structures. Pacific Connector has not identified the maintenance schedule for these dewater structures. DEQ 2019 noted additional crossing locations characterized by aquatic habitat value and steep, potentially unstable hillsides (See waterbody crossings at mileposts 34.46, 44.21, 55.71, 55.90, 55.94, 56.28, 56.34, 57.11, and others.) The pipeline alignment is located in portions of the Tyee Core Area of the Oregon Coast Range characterized by steep hillsides and shallow rapidly moving landslides (e.g. debris flows). To reduce the risk of landslides, the Oregon Department of Forestry recommends not discharging water or placing material on or near headwall areas. Pacific Connector waterbody crossing procedures do not include site-specific information necessary to demonstrate that the DEIS proposed action would site and operate the dewatering structures to prevent turbid discharge, sediment discharge, and debris flows into streams. Assertions in the DEIS that turbid discharge, sediment discharge and debris flow risk at dry open –cut stream crossings would be minimized have been shown to be unsupported statements with site specific analysis (DEQ 2019).

CO28-202

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CO28-202 See response to comments CO28-166 and CO28-190.

T. The DEIS proposed action fails to provide site specific controls to prevent excessive sedimentation and turbidity from Road Construction and use of existing access roads.

The DEIS proposes to use approximately 660 miles of existing access road to construct the pipeline. The DEIS identifies these existing access roads as gravel, dirt, rock, and pit run surfaced roads. As presented on Drawing Number 3430.31-Y-Map 1 through 34 of the submittal, many of these access roads traverse steep slopes and landslide hazard areas that are in close proximity to zero order streams (swales). During wet weather, the existing roads would experience traffic loads moving heavy equipment, logs, and construction overburden (e.g., soil, rock, slash) during the preparation for and the construction of the pipeline. Unpaved roads require careful attention to the selection o construction design and maintenance standards to support the anticipated traffic loads and prevent sediment laden water from roads entering stream channels directly or via overland flow in zero order basins. Proper selection of design standards for road surfaces prevent the failure of these surfaces under traffic loads. Heavy traffic on unstable road surfaces can result in excessive fine sediment discharge to streams during wet weather.

The DEIS fails to specifically identify BMPs that would disconnect portions of the road system from the stream system to minimize sediment delivery to roads from streams. Pacific Connector would use both existing privately-owned and public access roads for access to clear trees from the construction right-of-way, Temporary Extra Work Areas, and other areas necessary for building and operating the pipeline. Tree harvesting on non-federal lands would require compliance with Oregon's Forest Practices Act (FPA) rules. Oregon Department of Forestry (ODF) administers these FPA rules. FPA rules regulate road construction and maintenance on privately owned roads during forest harvesting operations in wet weather. ODF uses the FPA rules to ensure forest operations comply with water quality standards such as OAR 340-041-0007(1), (7), and (11). Maintenance standards for public and private roads tree harvesting and pipeline construction would also require compliance with road construction and maintenance standards for the U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management. These Forest Service and BLM standards include potential BMPs that could help assure compliance with the Statewide Narrative Criteria for road building and maintenance. These construction and maintenance standards would also help assure compliance with the DEQ turbidity water quality standards. The DEIS failed to explicitly adopt BLM Resource Management Plan BMP R-26 which would disconnect much of the road system from the stream system: "Disconnect road runoff to the stream channel by outsloping the road approach. If outsloping is not practicable, use runoff control, erosion control and sediment containment measures. These may include using additional cross drain culverts, ditch lining, and catchment basins. Prevent or reduce ditch flow conveyance to the stream through cross drain placement above the stream crossing." SWO RMP:171.

When DEQ lists waterbodies as water quality limited (not meeting standards) on the Clean Water Act 303(d) list, the Forest Service and BLM develop Water Quality Restoration Plans (WQRP) to guide Forest Service and BLM actions to protect water quality standards. The WQRP for the

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CO28-203 Appendix Y of the Transportation Management Plan of Development, section 2.2.1, states that all new temporary and permanent access roads will meet "agency design and road management standard" and that "all applicable agency BMP" will be applied.

South Umpqua. River identified roads as a source of sediment from erosion (see Page 43, DEQ 2019).

DEQ (2019) provided Pacific Connector with example requirements from the Forest Service regarding road maintenance. These Forest Service requirements stem from the Forest Service Handbook and provide Pacific Connector with water quality BMPs in the form of design and maintenance standards for unpaved roads on federal forestlands. DEQ (2019) reviewed Table A.8-1 in Part 2 of Appendix B and highlighted the lack of information on maintenance treatments and needed road improvements in this table. Road upgrades needed to prevent sedimentation of streams from motorized vehicle access during the wet season have not been adequately identified in the DEIS and supporting documents. Lack of upgrades means access roads will bleed coho killing sediment into the stream system. CO28-204

Once tree harvesting is complete, Pacific Connector proposes to grade a construction right-of-way including a construction access road for trenching and pipe laying equipment. This construction access road would require a durable surface to support heavy traffic loads and prevents fine soil particles from being pushed to the road surface and carried by stormwater to drainage swales along the construction right-of-way. This durable surface as well as its stormwater management system would require monitoring and periodic maintenance to avoid erosion and subsequent sediment discharge to zero order and first order streams on ridge tops and along steep slopes. The DEIS has not demonstrated on exactly how Pacific Connector would perform maintenance on each constructed access roads as well as the vast system of existing access roads. CO28-205

U. Northwest Forest Plan, Late-Successional Reserves, and Mitigation.

The Northwest Forest Plan (NWFP) Late Successional Reserve (LSR) standards and guidelines state (C-17) that pipelines should be planned to have the least possible adverse impacts on LSRs. "New access proposals may require mitigation measures to reduce adverse effects on Late-Successional Reserves. In these cases, alternate routes that avoid late-successional habitat should be considered." The DEIS failed to document that alternate routes around all LSRs were considered. CO28-206

The NWFP also states (C-17) that these types of proposals will be reviewed on a case-by-case basis and may only be approved when adverse effects can be minimized and mitigated. The DEIS fails to minimize the impacts, and fails to properly mitigate the impacts, as documented in these comments. Thus, the project violates the Northwest Forest Plan and its Standards and Guidelines. CO28-207

The NWFP only allows new developments like this in LSRs when the developments "address public needs or provide significant public benefits" (C-17). The NWFP gives examples, and exporting domestic fossil fuels to Asia was not included as having a significant public benefit or public need. Therefore, the pipeline is not allowed in the LSRs described by the Northwest Forest Plan. CO28-208

The NWFP does not allow some of the mitigation offered for clearcutting endangered species habitat. For instance, concerning the mitigation of placing wood in streams, the NWFP says (B-32): "In-stream structures should only be used in the short term and not as a mitigation for poor CO28-209

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CO28-204 See response to comment CO28-164.

CO28-205 See response to comment CO28-190.

CO28-206 As required by the NEPA, and the NWFP Standards & Guidelines, the Forest Service developed route alternatives that are disclosed in section 3 of the draft EIS at pages 3-31 to 3-37. Route modifications to avoid or minimize impacts to LSRs on the Umpqua and Rogue River National Forests were considered. However, due to the linear nature of the Project, some impacts to LSRs are unavoidable. As a consequence, the Forest Service identified route variations reducing impacts to LSOG and minimizing fragmentation of habitat by siting the project in existing managed stands, co-locating route with existing roads, and avoiding high quality LSR stands. Also, refer to appendix F.3 for impacts to LSR and avoidance/minimization strategies.

CO28-207 The Forest Service identified route variations reducing impacts to LSOG and minimizing fragmentation of habitat by siting the project in existing managed stands, co-locating route with existing roads, and avoiding high quality LSR stands. Also, a Compensatory Mitigation Plan for LSRs has been developed by the Forest Service (see section 2.1.5 and appendix F.3 of the draft EIS). The mitigation actions for LSR have been designed to be neutral or beneficial to the creation and maintenance of LSOG habitat by maintaining the overall acreage of LSOG within LSRs, and enhancing the function of the LSRs, e.g. through the addition of snags and large woody debris. Section 4.7.3.6 and appendix F.3 of the draft EIS include discussions of the steps that were taken to avoid and minimize impacts to LSOG forest in LSR and analyzes the proposed compensatory mitigation that is designed to be neutral or beneficial to the creation and maintenance of late-successional habitat.

CO28-208 The NWFP Standard and Guideline that addresses new developments in LSR is C-17. This standard specifically lists pipelines as an example of new developments that would be reviewed on a case-by-case basis and may be approved when adverse effects and be minimized and mitigated (see draft EIS section 4.7.3.6 and appendix F.3).

CO28-209 Page B-32 of the NWFP does not preclude placing wood in streams as a mitigation action. The placing of wood in streams by the Forest Service is not being proposed as mitigation for poor land management practices, it is being proposed as compensatory mitigation for unavoidable adverse impacts of the proposed project. Consistency with the ACS is addressed in section 4.7.3.5 and appendix F.4 of the draft EIS.

land management practices." FERC has not demonstrated that its mitigation will be effective or is even permitted under the NWFP. CO28-209 cont.

The DEIS failed to compensate for the increased Equivalent Clearcut Area (ECA) within each watershed. If the watershed has too many clearcuts, the additional ECA caused by the pipeline could cause peak flow increases, not allowed by the Aquatic Conservation Strategy of the Northwest Forest Plan. CO28-210

Other ACS objectives are not being met. For instance, some mitigation proposed to meet ACS objectives repairs damage caused by the pipeline, but does not restore habitat above that. This is the case with the 6.4 miles of fencing proposed on the Winema NF to keep cattle out of pipeline right-of-way. This should not be counted as mitigation. It is simply the cost to build the pipeline. CO28-211

Plants and wildlife on the Survey and Manage list of the Northwest Forest Plan have inadequate protections. Moving the pipeline around them, instead of the weak mitigations offered for destroying them, could have protected many of these areas. CO28-212

V. Forest Fire Threats.

Forest fires are a significant threat to the safety of the pipeline and the ecosystems of southern Oregon. For much of its length, the pipeline goes through fire-adapted forests, where forests burn naturally and often. Threats from fire include fire started by construction of the pipeline, other human-caused fire starts, and lightening.

The pipeline's lineal early-seral habitat could act as a wick, spreading the fire further and faster than if the pipeline were not there. A buried pipeline is also in danger of explosion if a sustained fire, such as in a slash pile or a fallen tree, burned over the buried pipe. Block valves also pose a threat if a fire burns over the above-ground pipes, especially if a block valve is within a fire perimeter and cannot be reached to turn it off. Wildland fire-fighting equipment is used on ridge-tops to create a fire-break, the same places where the high-pressure pipeline is buried. Most fires would occur in Class 1 areas, where the pipes are thinner and buried higher, increasing the fire-risk further. CO28-213

The DEIS fails to adequately address these fire threats.

One suggested mitigation (DEIS 2-34) is to create "Fuel Breaks". Page 4-172 even suggests "that the cleared right-of-way could serve as a fire break for large crown fires, thereby reducing the extent of a fire's spread". Fuel Breaks do not work, as fire is spread by embers flying over even wide fuel breaks. The DEIS (4-450) says: "Stand density fuel breaks would reduce the threat of losing late-successional habitat to fire." Fuel breaks would NOT reduce threats. The DEIS failed to correctly analyze these claims. CO28-214

The DEIS (4-172) admits to increased fire hazard by: "Certain activities associated with construction and operation of the Pacific Connector project (such as prescribed burning of slash, mowing, welding, refueling with flammable liquids, and parking vehicles with hot mufflers or tailpipes on tall dry grass) could increase the risk of wildland fires…" Plans to park vehicles on CO28-215

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CO28-210 The analysis in the draft EIS did consider the impact the Pacific Connector project would have on flow regime and peak flows within the watersheds subject to the ACS (see the tables addressing compliance with the ACS objectives for each watershed in section 4.7.3.5 and in appendix F.4 of the draft EIS).

CO28-211 The 6.4 miles of fencing on the Winema NF would keep cattle from grazing newly established revegetation in the pipeline right-of-way, but it has also been proposed by the Winema NF to provide additional protections to riparian reserves along Spencer Creek which is consistent with ACS objectives (see draft EIS section 2.1.5 and pages 2-78 to 2-80 of appendix F.2).

CO28-212 A complete analysis of Survey and Manage Species impacts are contained in appendix F.5 and summarized in section 4 of the final EIS in section 4.6.4.3. Where species may be impacted significantly because of limited known populations, the FS required route adjustments to avoid known populations. Refer to section 3 of the final EIS, Survey and Manage Route Variations. However, due to the linear nature of the project, all known populations could not be avoided because species occur in forested stands throughout the entire NFS lands adjacent to the current proposed route. Therefore, it was concluded that as long as Survey and Manage objectives for species persistence could be met, additional route adjustments were not warranted.

CO28-213 Fire risks as well as how the project would be affected by fires and effect the likelihood of fires is addressed in sections 4.4 and 4.13.

CO28-214 The text on page 4-172 of the draft EIS is misquoted. The text states, "It is also possible that the cleared right-of-way could serve as a fire break for large crown fires, thereby reducing the extent of a fire's spread;" the text goes on to state, "however, as discussed above, the presence of the cleared right-of-way could also increase the risk of crown fires occurring in the first place." The Forest Service has not proposed the pipeline corridor as a fuel break. The integrated stand density fuel breaks are designed to reduce the threat of stand replacement fires by reducing stand density, ladder fuels, and incorporating existing openings. Additional discussion has been added in section 2.1.5.1 and appendix F.3 in the final EIS.

CO28-215 Comment noted.

tall dry grass is alarming. FERC should prohibit this. CO28-215 cont.

The DEIS states (4-775) "In the event a fire was to occur on the surface in the vicinity of the pipeline, the presence of the pipeline would not increase fire hazards." This analysis is incomplete. It's not just the presence of the pipeline that would increase fire hazards. It is also the presence of the early-seral habitat in the right-of-way that increases fire hazards. Because these areas are sunnier and dryer, they are more fire-prone. Native and introduced brushes in the right-of-way instead of trees are also more volatile and burn hotter than in a mature forest. And because the right-of-way is linear, it has the ability to spread a hotter fire faster over the landscape. The DEIS only analyzed the risk of the pipeline to fire behavior when instead the DEIS should have included the risk of the right-of-way to fire behavior. Because the right-of-way will cause the fire to spread along the right-of-way, the damage to the forests, wildlife, and homes will increase near the right-of-way. CO28-216

The DEIS also claims that "Fires on the surface are not a direct threat to underground natural gas pipelines because of the insulating effects of soil cover over the pipeline. Soil is a poor conductor of heat…" The DEIS failed to consider impacts to the buried pipe when a slash pile or fallen tree sustain a fire over the pipeline. Sustained heat could compromise the pipe. Also, the pipeline will be buried as little as 18" in many places, especially rocky areas. The FERC should present some scientific evidence that heat, especially from a sustained fire, cannot penetrate 18" in rocky soils.[367] CO28-217

The DEIS claims (4-775) that "Pacific Connector would also have facilities built along the pipeline to aid in protecting the pipeline from wildfires. Along with Pacific Connector's pipeline control there are MLV sites on the pipeline to aid in isolating which portions of the pipeline have product in them." However, MLV sites (block valves) are above ground sections of the pipeline, not protected by soil. The DEIS should have considered the impacts if a MLV site, in a wooded area, were to experience a fire directly on the pipe. Also, the DEIS failed to consider the impacts if a MLV site is not accessible due to the presence of fire. MLV sites could be more of a fire danger than a fire control. CO28-218

There are longer distances between block valves in Class 1 areas, which would add to the problem of reaching a MLV in time. These valves are placed in forested areas, thus, it could be impossible for personal to drive through a forest fire to reach them. Take for instance Block Valve #9, that had been proposed near MP 106 in the middle of the 2015 Stouts Creek Fire. If there had been a pipeline with gas during that fire, it would have been impossible to reach that MLV. In the newest proposal, that MLV has been moved to private industrial forest land[368], at even greater risk of a wildland fire.

The DEIS claims (4-775) that: "In past situations, local operation personnel have protected above ground mainline valves by burying the valves with sand and earth material." Is Jordan Cove claiming that they will do this to protect block valves threatened by fire? If so, there should be some assessment of where the sand or dirt will come from, how much sand is needed to burry a

[367] DEIS 4-770: "Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated (solid) rock".
[368] Table 2.1.2.1-1 page 2-19.

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CO28-216 Wildfires are addressed in section 4.4, 4.5, and 4.13. Implementation of measures outlined in the *Fire Prevention and Suppression Plan* (Appendix K of the POD) would minimize the risk of fires associated with construction and operation of the Project. Additionally, this plan includes fire response procedures to be implemented in the event of a fire.

CO28-217 The commenter is incorrect that "sustained heat" from a slash pile can create heat levels that are sufficient to overcome the insulating properties of soil or ignite the gas in the subterranean pipeline. The commenter has failed to support their claim or provide any evidence to justify this claim. The text, as written in the EIS, is correct.

CO28-218 The MLV can be remotely accessed to shut off the gas. Direct access to them in an emergency is not required.

40' section of pipe 10' off the ground, and how the block valve will be accessed if it means driving through the middle of a wildland fire. CO28-218 cont.

The DEIS failed to analyze what would happen if there is a rupture in the pipeline. A catastrophic fire will result. The location of the pipeline is a very rural, very rugged area without prompt access to any kind of first responders, much less fully equipped crews to suppress a gas-fueled fire. As history indicates, professional fire crews from the State of Oregon, Forest Service, Bureau of Land Management, and other federal and state agencies rarely are able to suppress wildfires in this country, much less a fire fueled by natural gas. The DEIS does not analysis the likelihood that such a fire could occur, or what the environmental consequences would be. The lack of analysis is arbitrary, capricious, and not in accordance with law. 5 U.S.C. § 706(2)(A). CO28-219

Another problem is the right-of-way will cause more fire suppression. It is environmentally advantageous and economical to treat many wildland fires as a controlled burn, and not suppress them in the backcountry when it doesn't threaten homes or other infrastructures. However, the presence of a pipeline in the back-country will mean that more wildland fires will have to be suppressed, fires that otherwise would have been treated as natural, beneficial fires. The DEIS failed to consider this problem. CO28-220

The pipeline would be buried as little as 18" deep in class one areas (DEIS 4-770). However, just 4 pages later, in the DEIS section called "Pipeline Standards to Minimize Fire Risk to Forest Lands", the DEIS contradicts itself, saying the pipe would have "at least 24 inches of cover in consolidated rock". Even if 24" is the correct answer, it is still too shallow to protect the pipe from a sustained surface fire. CO28-221

This section, "Pipeline Standards to Minimize Fire Risk", has NO proposed standards to minimize fire risk, which is a high risk in Oregon's fire-adapted forests that burn naturally and burn often. The only standard proposed is to communicate with local fire officials, and proposed increase training, of which a substantial portion of the cost would be born by local fire officials[369]. CO28-222

Pipeline in-water construction activities, many of them highly fire hazardous, are planned to take place almost entirely during southern Oregon's increasingly intense fire season, thereby posing a serious risk of sparking wildfires and resultant costs to public health and safety [ORS196.825(3)(e)] and water quality.

The Applicant plans for pipeline construction to begin in January 2021 and be completed in December 2022, with peak work during the summer of 2021. They anticipate a total of 1,500 workers across the five crews.[370] Construction of a buried pipeline requires the use of heavy equipment and explosives, activities that carry with them significant risk of starting wildfires. For example, to create a 95-foot-wide clear-cut right-of-way, trees would be felled using chain CO28-223

[369] DEIS 4-775: "Pacific Connector would participate in any simulated emergency exercises and post-exercise critiques…. The majority of the training costs would be borne by Pacific Connector…" The other portion of the training costs could be significant.
[370] DSL Application APP0060697, Section 2 PCGP, Attachment A.2, Resource Report 1, General Project Description. "Construction Procedures." PDF p. 2138.

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CO28-219 As indicated in section 4.13, the risk of accidents (e.g., ruptures) is very low.

CO28-220 We disagree that the right-of-way would result in a substantial increase in wildfire suppression, or result in a loss of control burns. The commenter has not provided any justification for these claims.

CO28-221 As disclosed in section 4.13 of the EIS, the pipeline would be buried to depths required by the USDOT. As required by the USDOT, the pipeline may be buried to a depth of 24 inches in areas containing consolidated rock. We note your disagreement with the USDOT's safety standards.

CO28-222 This is incorrect. The EIS disclosed multiple measures that would be implemented in regards to fire (e.g., see the *Fire Prevention and Suppression Plan* as well as the requirements that the project follow the NFPA 56 "Standard for Fire and Explosion Prevention during Cleaning and Purging of Flammable Gas Piping Systems" or NFPA 51B "Standards for Fire Prevention During Welding, Cutting, and Other Hot Work")

CO28-223 It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations or OARs. We assume that the State would determine if the Project is in compliance with the State requirements and OARs during their review of the Applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all applicable federal and federally delegated permits.

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saws and feller-bunchers; brush would be cleared, including by bull-dozing across rocky ground; 10-foot-deep trenches would be dug, using where necessary rock-saws, rock drills, and blasting; and pipe would be laid and welded. Trenches would then be backfilled to bury the pipeline, again with heavy equipment in rocky terrain.

To comply with Oregon's Fish Passage Law and Oregon Department of Fish and Wildlife (ODFW) guidelines, the company has agreed to confine pipeline construction activities in almost all water crossings to ODFW's "fisheries in-water construction windows." These windows are set so impacts to fish through damming, dredging, removal and fill, and blasting occur when key fish species are least likely to be present.[371] These windows also correspond to fire season. The construction windows for the pipeline route indicate that 90% of highly hazardous work at water crossings in Coos, Douglas, and Jackson County would occur primarily when fire danger is "high" to "extreme." Using Jackson County as an example, all but one of 77 crossings would occur between June 15 and September 15.[372] In 2017, the Oregon Department of Forestry (ODF) instituted "high danger" level in Jackson and Josephine Counties from June 30 to September 17--"extreme danger" ran for 52 days from July 24 to September 14. In 2018, "high danger" level ran from July 3 to September 30—fire danger was "extreme" for 54 days from July 20 to September 12.[373] PCGP's Construction Procedures do not discuss the above ODF compliance in terms of their overall work schedule so it is not clear when they intend on performing out-of-water construction activities.

CO28-223 cont.

The proponent would need to obtain permits or authorizations to operate heavy equipment from landowners, including the ODF, the U.S. Forest Service, and the BLM. For example, ODF requires a Permit to Operate Power Driven Machinery (PDM). Authorizations require the Applicant to agree to comply with prescribed practices to minimize the risk of a fire being ignited and be prepared to respond in the event of fire.[374] ODF evaluates requests for waivers of restrictions by fire danger level on the basis of conditions at the time and place of work and the willingness of the operator to agree to take precautions to make the operation fire safe.[375] PCGP can be expected to commit to comply with necessary procedures, but fire officials can expect public apprehension about all summertime pipeline construction, let alone waivers allowing work during Industrial Fire Prevention Level IV periods when work stoppage is generally enforced. In recent years, due at least to climate change caused increased temperatures and drier conditions, the risk and incidence of accidental, human-caused fires getting out of hand is increasing. More fires are becoming conflagrations. Circumstances in the wake of the two most recent destructive and deadly fires in California may suggest liability issues could be raised. The last step of the pipeline construction process is reclamation. Among other activities, an average of 1 ton per acre of slash left by the original clearcutting would be spread over the right-

[371] *Ibid*, PDF p. 2139; ODFW, *Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*, June 2008.
[372] DSL Application APP0060697, Section 2 PCGP, Table B.3-4, "Fish Utilization, EFH, Crossing Techniques/Rationales, In-Water Work Windows, and Bridges for Waterbodies," PDF pp.1525-85.
[373] Email Herb Johnson, ODF Forest Officer/Prevention Coordinator to Ron Garfas-Knowles, Ashland Fire & Rescue, January 29, 2019
[374] Oregon Department of Forestry, "Industrial Fire Precaution Levels (IFPLs) for Oregon Department of Forestry Protection west of the Cascades."
https://www.oregon.gov/ODF/Fire/Documents/2017%20IFPL%20for%20Web.pdf
[375] Email from Dave Lorenz dated 1.8.2019.

of-way, adding to already existing fuel loads. This amount exceeds the FERC's "Upland Plan;" the Applicant has indicated that they will seek a waiver.[376]

Southern Oregon communities already endure months-long summertime periods when wildfire smoke makes air quality unhealthy and makes outdoor activities unsafe. These conditions are having a heavy economic impact. The state and impacted counties are struggling to pay for the fires that are getting out of hand with just the risky circumstances of human-caused fire we now face. Concerns about this reality are among those raised by the Jackson County Commission in its January 22, 2019 comment to DSL, urging denial of the current removal-fill permit application we are considering.

W. The DEIS Does Not Clearly Identify All Affected Waterbodies and fails to fully comply with 40 CFR §1502.22 "Incomplete or unavailable Information."

The DEIS fails to clearly identify all affected waterbodies. According to the DEIS, the pipeline, associated workspace, and equipment bridges would be located across 19 HUC-5 watersheds and an additional 5 watersheds would be crossed by the proposed access roads. The pipeline would be constructed across or near 352 waterbodies, including 69 perennial streams, 270 intermittent streams, 9 perennial ponds, and 4 estuaries.[377] However, according to Resource Report 2 provided by the applicant, the pipeline would cross 400 waterbodies.[378] The DEIS does not address this discrepancy and there may be additional waterbodies that may be impacted by the proposed activities that are not identified in the analysis.

CO28-224

The DEIS 4-130 states: "Pacific Connector conducted wetland delineations of pipeline related workspaces. For areas where on-site delineation was not possible due to lack of landowner permission, Pacific Connector used USGS topographic maps, NRCS soil surveys, FWS NWI maps, and aerial photography to identify wetland type and boundaries." (i.e. desktop analysis).

DEIS 4-135 states: "Pacific Connector surveys have identified a number of springs and seeps, as noted in appendix H of this EIS. Pacific Connector has stated that it would further verify exact locations of springs and seeps during easement negotiations with land managers." and "Pre-construction surveys would be conducted to confirm the presence and locations of all groundwater supplies within and adjacent to the pipeline right-of-way." Apparently Pacific Connector has not obtained on-site delineation of all springs, seeps and groundwater supplies. This is important because the DEIS:4-135 states "Spring and seeps supplied by shallow groundwater, however, may be effected by the pipeline project, particularly if the pipeline is directly up-gradient of a spring or seep location.

CO28-225

Wetlands, stream crossings, seeps, springs, groundwater supplies typically require onsite evaluation to determine the feasibility of installing the pipeline by minimizing or eliminating the impact to the wetlands, stream crossings, seeps, springs and groundwater supplies. For example, onsite soil core sampling are needed to determine the feasibility of HDD or Direct Pipe that

[376] DSL Application APP0060697, Section 2, PCGP, Attachment A.2 (RR1 General Project Description), "Construction Procedures," PDF pp. 2146-47.
[377] 2019 DEIS at 4-92.
[378] Resource Report 2, 6)

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CO28-224 Resource Report 2 includes wetlands in the tables listing waterbody crossings. Wetlands and streams (including ponds, ditches estuarine channels) are addressed separately in the EIS which is why the numbers differ. Furthermore, the Applicant has submitted numerous filings since the initial Resource Report 2 (as referenced in this comment) that has altered the proposed route and the subsequent number of waterbody crossings.

CO28-225 We disagree that the analysis did not adequately consider potential effects for areas where site specific information was not available. The types of stream and bank construction methods for stream crossing have standard procedures that would be used at all crossings. Depending on determined risk level of a crossing additional BMPs may be implemented. Risk levels were based on field data when available and desk top information where access to site locations could not be obtained (see response to comment CO28-166). Once access is allowed, those sites only assessed by desktop analysis would be visited and risk level finalized. If risk level changes after field site visit appropriate BMP would be implemented. Wetland delineation surveys would be conducted in areas of the proposed pipeline right-of-way where access has been denied would be conducted prior to construction. These surveys cannot be completed at this time because of lack of access granted by landowners. If the project is approved, the Applicant would acquire access through eminent domain and wetland delineation surveys would be conducted prior to construction. Also as stated on page 4-81 of the draft EIS and in the *Groundwater Supply Monitoring and Mitigation Plan*, pre-construction surveys would be conducted to confirm the presence and locations of all groundwater supplies for landowners within and adjacent to the proposed pipeline right-of-way. During easement negotiations the landowner can work with Pacific Connector on siting the line within individual properties to increase the distance between the pipeline and any springs or wells.